MAY
15
1959

PETROLEUM WEEK

A McGRAW-HILL PUBLICATION

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Southwest

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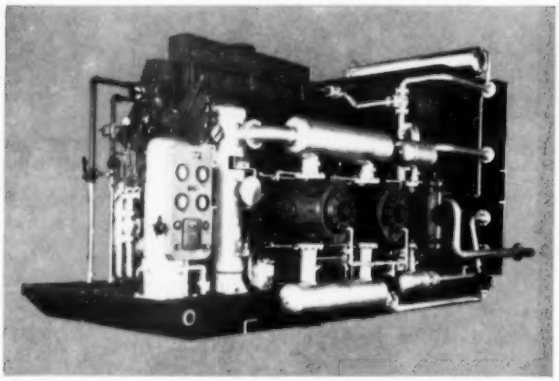
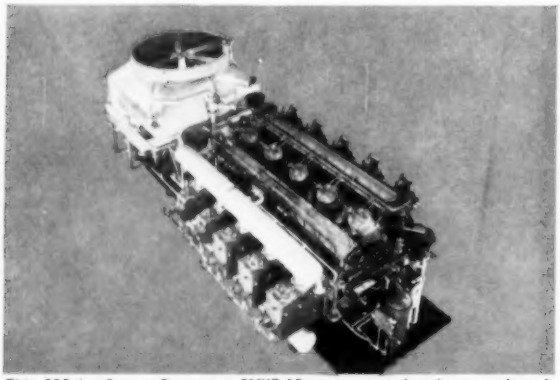
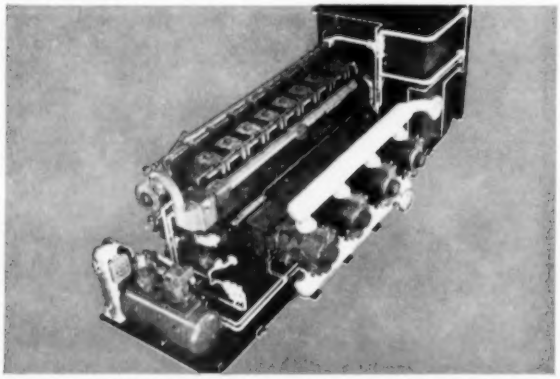
Using the Compressor You Select



A 330 hp Ingersoll-Rand SVG-6 compressor, packaged by Southwest Industries, is in gas lift service in the swamps of Louisiana.



This 660 hp Cooper-Bessemer GMXD-10 compressor has been packaged by Southwest for gas gathering service on an offshore platform in South Louisiana.



This 750 hp Worthington SLHC-8 compressor in a Southwest Packaged Plant is being used by a major gas company for pipeline boosting in East Texas.

Southwest Packaged Gas Engine-Driven Compressor Plants are complete, portable skid-mounted units for gas lift, gas booster, pressure maintenance, main line pumping, and similar projects. A Southwest Compressor Plant is a complete engineered unit, built right by men who know compressors.

To the advantages of Southwest design and engineering, you can add flexibility by selecting your own make and type compressor in sizes from 25 to 2500 hp. Using the compressor of your choice, you do not need to re-train personnel or to increase spare parts inventory; yet, you can take full advantage of the vastly improved and superior design of the Southwest unit.

Southwest units installed in the field are now producing well over 110,000 horsepower — compressing almost 2 billion cubic feet of gas per day. Let a Southwest engineer explain the economics of packaged gas compressors to you.

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Designers and manufacturers of Packaged Gas Compressors, Packaged Inert Gas Generators, Packaged CO_2 Removal Units.

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That reference to the old song is appropriate because Sinclair has long been a leader in making airline engines sing. The new jet engines take to Sinclair lubricants just as piston engines have done for years. These lubricants have been approved by all leading U.S. jet engine manufacturers and are used in both commercial and military service.

Latest figures show that Sinclair Refining Company supplies 45 per cent of all aircraft oil used by major scheduled domestic airlines and is also a leading supplier of jet fuel.

This sales record, made where dependability of product is essential, testifies as to the quality of Sinclair's research skills and manufacturing techniques.

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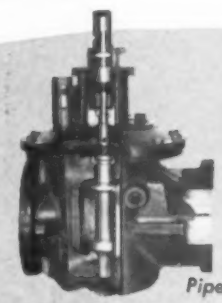

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A McGRAW-HILL PUBLICATION

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INSIDE *Slant*

OIL UNITY QUESTIONED

The question of industry unity came in for some serious examination at the recent meeting of the Texas Independent Producers & Royalty Owners Assn., at Dallas.

It cropped up in committee sessions on public relations, gas matters, and imports.

The gist of the discussion:

It is doubtful if the industry can present a solid front on some issues when the interests of various segments are in fundamental conflict.

If this attitude comes to a head, it may be over the depletion issue.

It was pointed out, on the one hand: "As domestic producers, if we defend foreign depletion, we'll lose our own."

And on the other hand: "It's like taking the first olive out of a bottle. Once they take one part of percentage depletion away, they'll be back to take more of it. We always get weak when we lose our principle."

And a sharp distinction was drawn during the meeting between "all producers" and "independent producers" when it comes to gas regulation.

But there was no question but what TIPRO would support legislation to free all producers.

LeRoy Menzing
EDITOR

COST TO OPEN?
COST TO CLOSE?

The new Cameron Gate Valve will give you more trouble-free operating cycles for your money than any other valve on the market. When you buy a valve for water, oil, gas or mud service, you are paying for opening and closing cycles. But how many for how much? This is the question more and more buyers of these valves are asking.

Any approved valve will hold pressure when new and first installed in the line, but what happens afterward determines the actual cost. The easy-operating Cameron Gate Valve will perform more opening and closing cycles without repair because of its exclusive rotating seat design. The wear pattern changes and extends the life of this unusual valve each time it is operated. No continuous lubrication program is necessary to maintain a tight, leak-proof seal. Finally, when repairs become necessary, the Cameron Gate Valve need not be removed from the line for expensive shop repairs. A convenient sealing element package makes it a new valve in less than half the time required for other in-line valve repairs. You can COUNT ON CAMERON Gate Valves for lowest cost per operating cycle.

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DEPT/Opinions

Views That Make News . . .

"The original [depletion] rate of 27.5% is less equitable for present oil producers than it was in 1926. In that year, the average price of oil in the U.S. was $1.88 per bbl. In 1957 the price was $3.09 per bbl., making a 64% increase in the depletion base.

"Meanwhile, the cost of finding and producing oil increased more than 500%. . . . Thus, to offset changed conditions, the percentage depletion would need to increase to 33⅓%."

—HENDERSON SUPPLEE, JR.
President
The Atlantic Refining Co.

"Unless the American customer recognizes that increased gasoline taxes are his own personal business and that these taxes are coming out of his family's pocketbook, the gasoline tax and all other taxes will continue to rise and will continue to be diverted for whatever uses tomorrow's politicians may choose.

"We must resist—all of us—any attempt by any state or federal groups to impose these additional tax burdens upon the already-burdened motorist."

—R. W. MCDOWELL
President
D-X Sunray Oil Co.

"On one principle we must remain firm: Any exemptions or exceptions [in mandatory controls] must not be allowed to increase the total import level. In other words, if imports from Canada are allowed an increase, corresponding cuts must be made in import quotas from other areas so that the total supply does not exceed the level necessary to restore domestic industry health and vigor.

"A program which is subject to any constant upward adjustment in imports, even though it is mandatory, will prove no more adequate to the objective than did the voluntary program."

—HARRY C. JONES
President
Texas Independent Producers & Royalty Owners Assn.

"I believe that business management here must support foreign investment programs both by our government and by our private industry. This is going to create competition for American business. As this competition becomes more intense, too many American businessmen are pressing for government action to secure for themselves sheltered positions. . . . They give lip service to the concept of competition but are unwilling to accept the fact of competition in their own businesses. It is a fact that, in many fields, Americans are conducting a high-cost, poor-quality operation as compared with foreign producers."

—R. L. MINCKLER
President
General Petroleum Corp.

"The oil firms say they don't drill enough at home. But they don't want any oil brought in from abroad either. What they really want is to keep oil scarce and keep the price high. Just look at what we are doing to other oil nations. We increase their problems and alienate them because they have the oil to sell and we won't buy it even when it's cheaper than ours."

—DR. FRITZ MACHLUP
Professor of Economics
Johns Hopkins University

"The modern industrial establishment is the agency which made the pursuit of technology a full-time job—and not for a few men, but for hundreds of thousands. It has provided a focal point for the development of technology, taking it out of the sideline class and making it a full-time profession."

—HENRY B. DU PONT
Vice-president
E. I. du Pont de Nemours & Co.

. . . and Letters

Dear Sir:

We came across an error [in PETROLEUM WEEK] which could create some resentment among Indonesian readers over here. Among the countries visiting the International Petroleum Exposition in Tulsa, you listed both Indonesia and Sumatra [PW—Jan.23'59,p49].

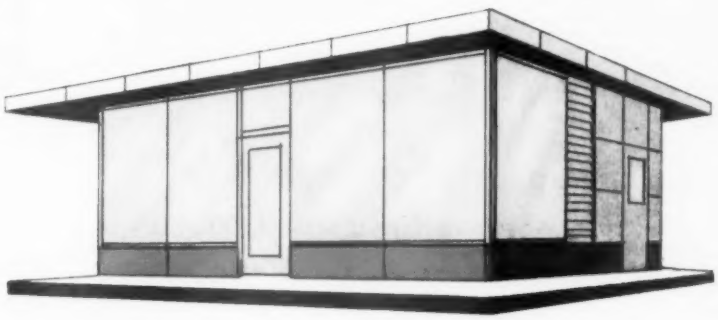
As you know, there is no such Sumatra state. The island of Sumatra is still part of the Republic of Indonesia.

—R. I. SAJONO
Assistant manager, public relations, N. V. Standard-Vacuum Petroleum Mij.
Djakarta, Indonesia

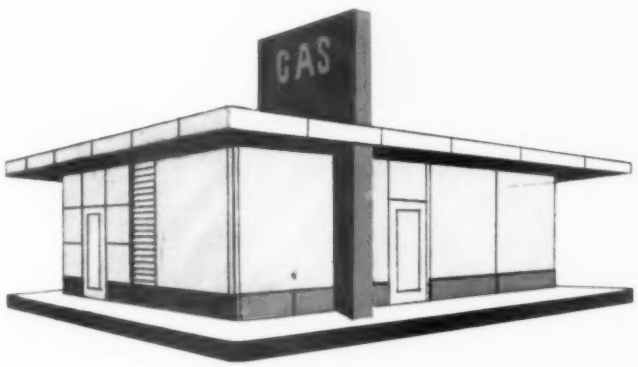
PETROLEUM WEEK *will publish reader comments each week. Address letters to LeRoy Menzing, Editor,* PETROLEUM WEEK, *330 W. 42nd St., New York 36, N. Y.*

AVONCRAFT porcelain enamel stations

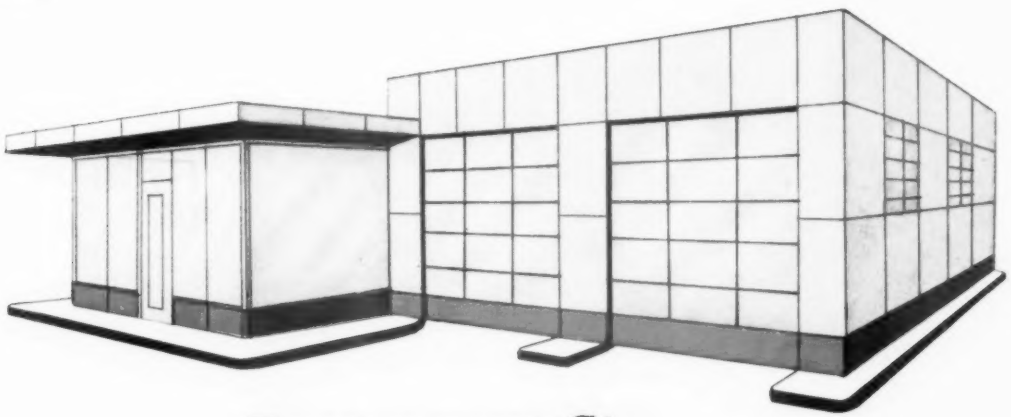
smart marketing strategy for multiple pump operators



This new and modern concept in porcelain enamel has both sales appeal and flexibility in station design. Bays and pylons can be added in vivid colors to suit your identity or trade mark. Avoncraft *ALL PORCELAIN* buildings are light, durable, maintenance free . . . stay bright and clean. And, should the traffic pattern change, your stations can be moved to a new location . . . fast! For sales appeal with economy, consult Avoncraft now!



Send for our new brochure showing Avoncraft stations in full color.



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Send inquiry to: P.O. Box 2687 Ford Division, Ford Motor Co. Detroit 31, Michigan

'59 Ford Pickups beat average mileage of other leading makes by 25.2% in Economy Showdown U.S.A.

Here at last is certified proof of the differences in gas mileage between six-cylinder pickups . . . evidence that you can use in your operation.

It was compiled by America's foremost independent automotive research firm after testing 1959 six-cylinder, ½-ton pickups of the six leading makes. All trucks were bought from dealers—just as you would.

The tests paralleled every kind of driving – high speeds and low, open highways and city traffic, even door-to-door delivery. And in every test, '59 Ford Sixes delivered more miles per gallon than any other make. Here are the actual percentages:

HOW NEW '59 SIXES RATE IN GAS MILEAGE						
'59 FORD SIXES GIVE	25.2% more miles per gallon than Make "C"	31.1% more miles per gallon than Make "I"	9.6% more miles per gallon than Make "G"	42.6% more miles per gallon than Make "D"	22.0% more miles per gallon than Make "S"	25.2% more miles per gallon than the average of all makes

Taken together, Ford got 25.2% more miles per gallon than the average of all other leading pickups!

What's the secret of Ford's economy? First, of all pickup sixes, only the Ford Six has modern Short Stroke design which reduces engine friction and thus requires less fuel. Second, to this modern engine, Ford has added a new economy carburetor to meter fuel more precisely in both high- and low-speed ranges.

See your Ford Dealer for the complete report of Economy Showdown U.S.A. Visit him today and get the whole story firsthand.

NOW! DURING DIVIDEND DAYS AT YOUR FORD DEALER'S...

GO FORDWARD for savings

Jack Long
President
Long & Wetzel, Inc.
Mt. Pleasant, Mich.
says:

"We've had less downtime with Ford Trucks than with any other make we've used!"

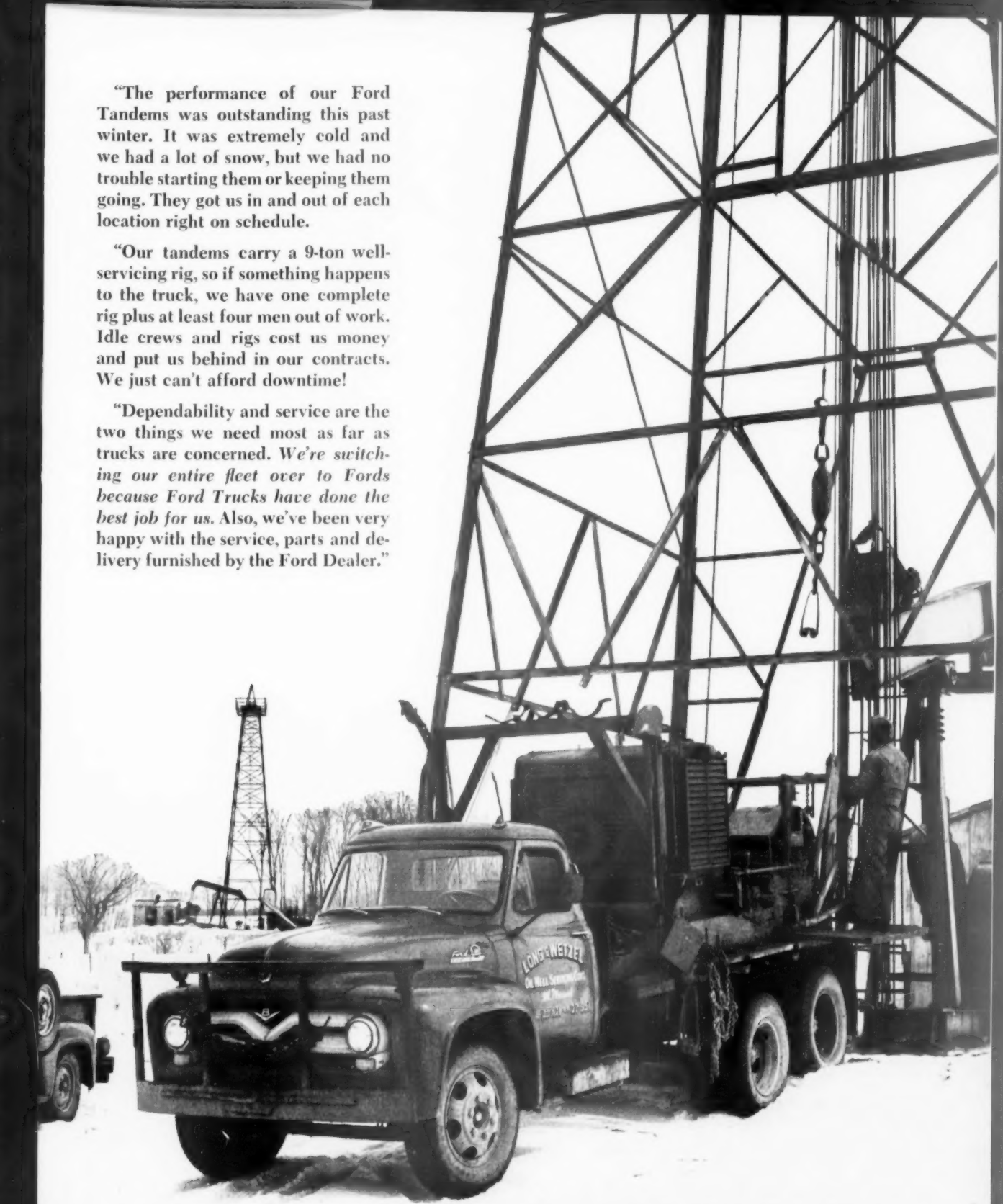
"We service oil wells all over the state of Michigan, plus the northern parts of Ohio and Indiana and I don't think there's a tougher truck operation. Our Ford Trucks are always on the job and most of the jobs take us a long way off the road—in fact we frequently have to make our own roads.

Visit
THE FORD TRUCK EXHIBIT
International Petroleum Exposition
Fairgrounds, Booth 6E, Tulsa, Oklahoma
MAY 14-23

"The performance of our Ford Tandems was outstanding this past winter. It was extremely cold and we had a lot of snow, but we had no trouble starting them or keeping them going. They got us in and out of each location right on schedule.

"Our tandems carry a 9-ton well-servicing rig, so if something happens to the truck, we have one complete rig plus at least four men out of work. Idle crews and rigs cost us money and put us behind in our contracts. We just can't afford downtime!

"Dependability and service are the two things we need most as far as trucks are concerned. *We're switching our entire fleet over to Fords because Ford Trucks have done the best job for us.* Also, we've been very happy with the service, parts and delivery furnished by the Ford Dealer."

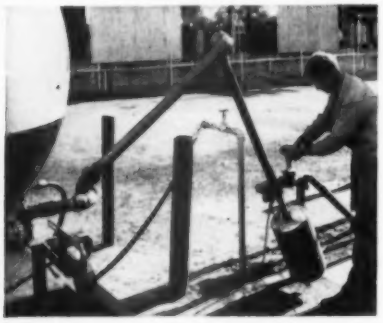


FORD TRUCKS COST LESS

LESS TO OWN . . . LESS TO RUN . . . LAST LONGER, TOO!

SWIVELING STEEL ARMS TAME TRICKY LPG

CHIKSAN LOADING ARMS REDUCE HANDLING HAZARDS TO A MINIMUM



In service for almost 5 years, this modern efficient Chiksan Loading Arm permits convenient loading of customer service trucks with untold safety and speed.

Situation: A large west coast LPG bulk plant hauls product from the refinery to the Company's storage tank in a 5,050 gallon tanker. Unloading was carried out with conventional type hose. However, even with extreme care, hoses were wearing out in a period of several years. And while most replacements were made in ample time, there were several minor mishaps resulting from ruptured lines.

Solution: Working with a Chiksan representative, a dual all-metal loading arm was installed. This dual arm hook-up permits unloading the 5,050 gallon transport thru a 3-inch suction pump in approximately 50 minutes. For loading smaller service trucks, single Chiksan loading arms were installed.

Benefits: In addition to their unlimited 360° free swiveling flexibility, Chiksan Loading Arms are counterbalanced for easy handling and maneuverability. And with only occasional attention required to keep them in top working condition, the service life of these Chiksan arms is almost indefinite.

Contact: A closeby Chiksan representative is ready to analyze your LPG handling requirements and make specific recommendations. Write Chiksan today for his name and for a copy of our current catalog.

A SUBSIDIARY OF FOOD MACHINERY AND CHEMICAL CORPORATION

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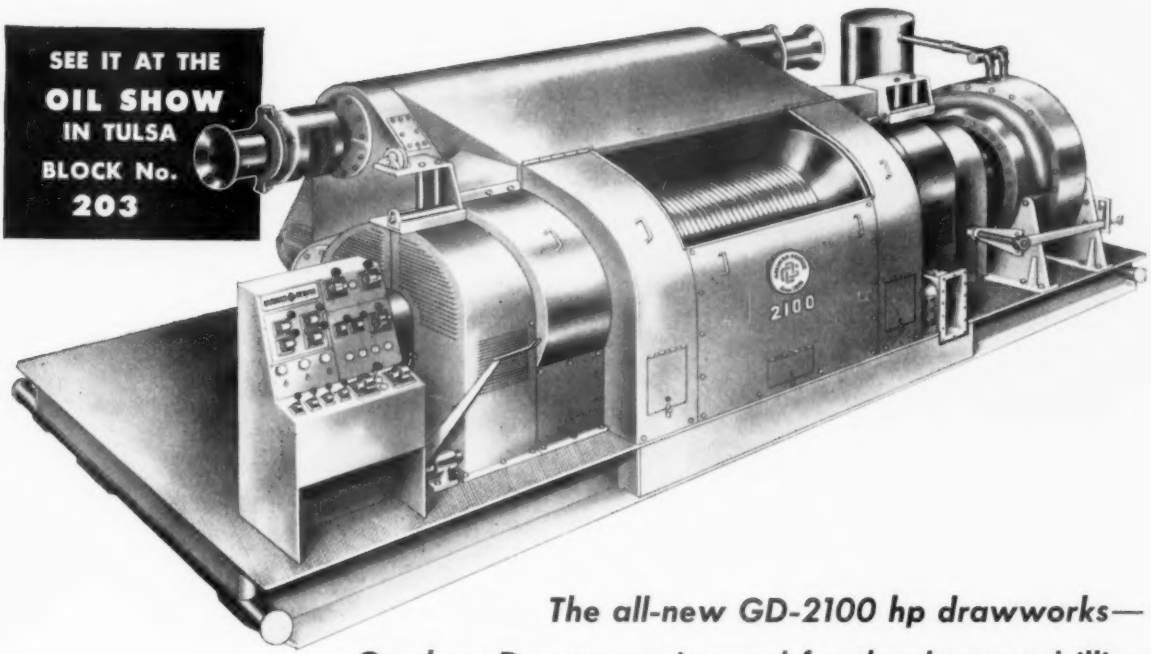
CHIKSAN

CHIKSAN COMPANY—BREA, CALIFORNIA • CHICAGO 5, ILLINOIS • NEWARK 2, NEW JERSEY

Well Equipment Mfg. Corp. (Division), Houston 1, Texas • Subsidiaries: Chiksan Export Company • Chiksan of Canada, Ltd.

FIRST ONE-PIECE DRAWWORKS DESIGNED FOR DEEPEST WELLS

SEE IT AT THE OIL SHOW IN TULSA BLOCK No. 203



The all-new GD-2100 hp drawworks—Gardner-Denver engineered for the deepest drilling today and tomorrow . . . more than 130,000-lb. single line pull

ANOTHER OIL FIELD FIRST FROM GARDNER-DENVER

Like the famous Gardner-Denver mud pumps, the new Gardner-Denver drawworks has been engineered for mobility, rugged dependability and simplified maintenance in the field. Like all Gardner-Denver oil field products, the GD-2100 has been built by men who know the field, for there's no substitute for men—our 100-year philosophy of growth.

Unitized construction—Complete drawworks is moved as one load. Chains stay in place, sealed inside of dust-tight housing.

Protects costly line—Extra large drum measures 36″ dia. x 60″ long. Spools 1½″ drilling line with minimum stress and wear.

Smooth power flow—Eight forward drum speeds; two reverse. Four forward rotary speeds; two reverse. Disc-type air clutches.

Proper braking feel—Two 60″ dia. x 12″ wide brake bands have 330° wrap. Total braking area: 3744 sq. in. Tension-type equalizer.

Easily mastered controls—Foolproof air controls grouped in natural operating sequence. Most frequently used controls are free from congestion.

Designed for field maintenance—All service points are readily accessible. Expendable parts replaced without major dismantling. Standardized components available at supply stores.

GARDNER-DENVER Since 1859 — 100 — 1959

EQUIPMENT TODAY FOR THE CHALLENGE OF TOMORROW

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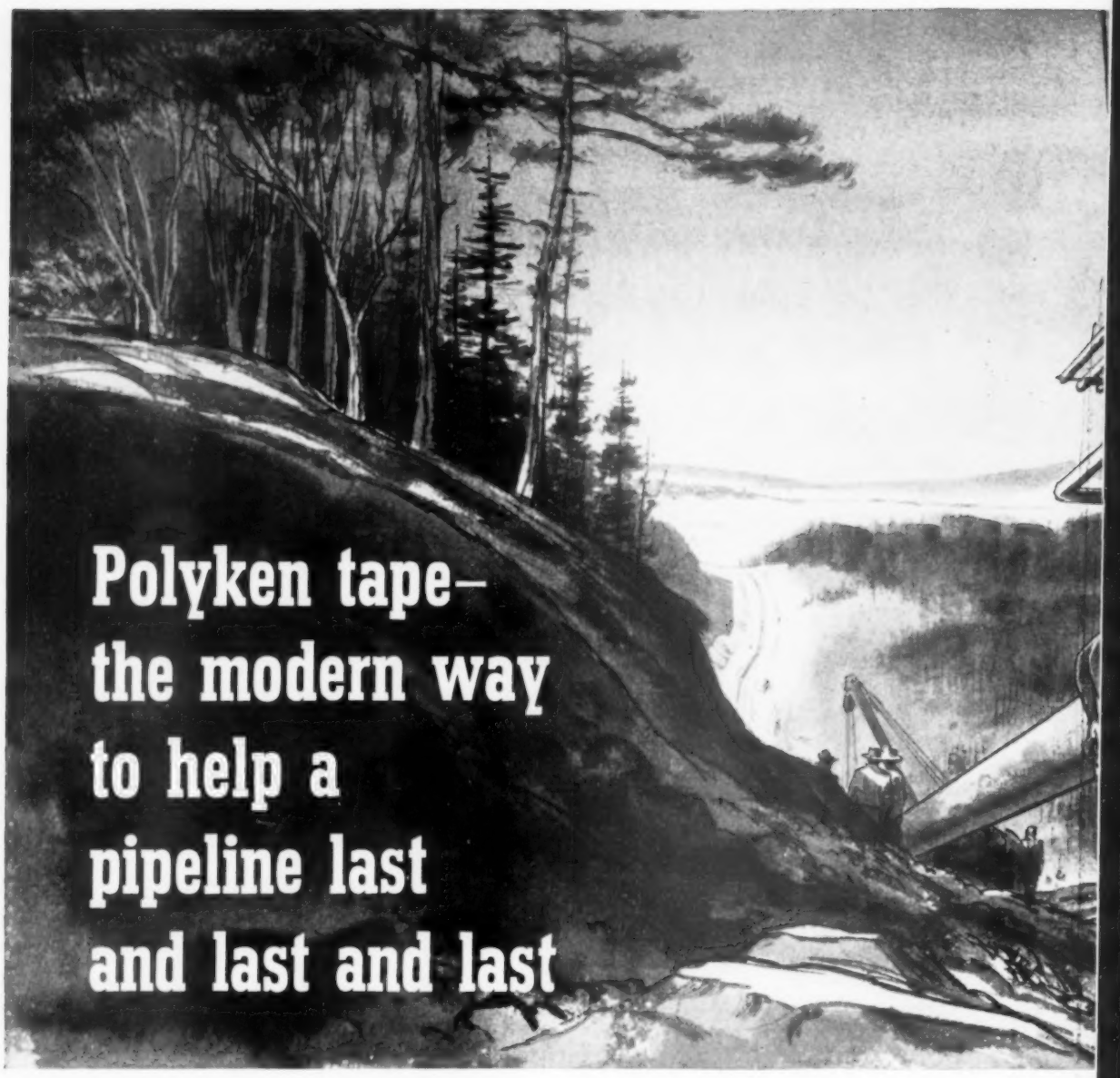


Polyken tape– the modern way to help a pipeline last and last and last

Polyken polyethylene tape, noted for its construction economies, now proves its dependability on the big jobs.

There's good reason why more and more pipeline is coated this way today—the modern way—with Polyken tape.

The reason is *performance.*

Take the experience of the Houston Texas Gas and Oil Corporation—the largest single pipeline coating order in history.

First, they had their engineering staff give Polyken intensive corrosion-resistance and performance tests. They checked the experience of other users. They studied tape construction practices as an important source of applied quality control. They analyzed tape coating spreads and saw the actual difference in unit operations and costs between the Polyken method and the ordinary enamel method.

Polyken passed with flying colors.

Then they added up the dollars and discovered that a Polyken-wrap job would save them better than half a million dollars, compared with the conventional "hot dope" coating.

Advantages like these can be yours. To get the full story on how Polyken can do a better job for

you—and save you money—call your Polyken Representative, or write Polyken Sales Division, 309 W. Jackson Blvd., Chicago 6, Illinois.

Polyken®

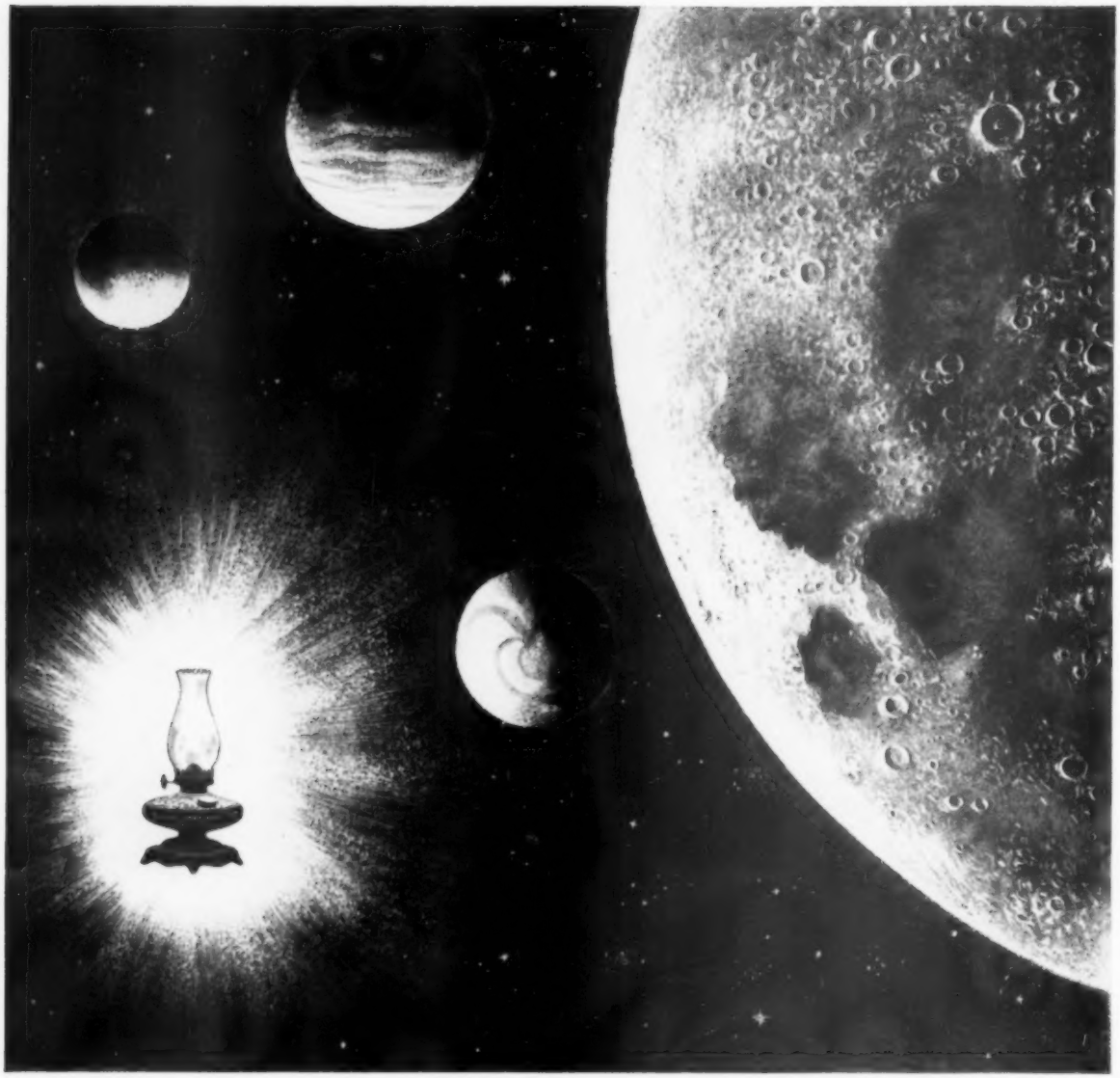
EXPERIENCED IN PROTECTIVE COATINGS

THE KENDALL COMPANY

Polyken Sales Division

↑ Pipeline is simultaneously cleaned and wrapped. Polyken Tape (dark spools) goes on without a primer, in factory-uniform condition... then is overwrapped (gray spools).

← The Houston line gets Polyken-wrapped pipe into the ditch immediately after coating. Fieldmen say this method makes for a tight, clean, fast spread.



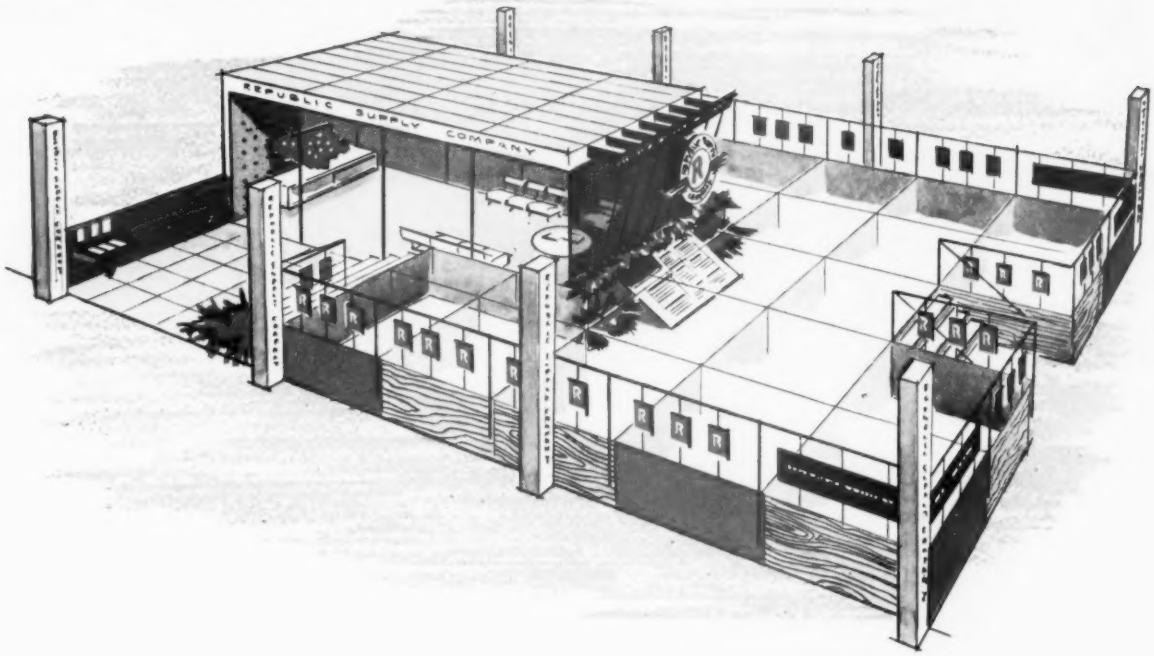
Let's keep our dreams big

A century ago a man dreamed of finding enough oil to light the lamps of the world. At the time, it appeared to be an ambitious dream, indeed, but it has been fulfilled more than a thousandfold.

Wanted for the next 100 years . . . more and bigger dreams from men with the vision and determination to make them come true.

STANDARD OIL COMPANY OF CALIFORNIA

Be sure to visit the



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unusual, unique exhibit at the

INTERNATIONAL PETROLEUM EXPOSITION

Through a specially constructed GLASS floor, you will view one of the most unusual displays of top quality petroleum and industrial products available today.

Be sure to put the REPUBLIC SUPPLY exhibit on your check list of booths to visit at the I.P.E. You are cordially invited to use our air-conditioned lounge for your convenience and relaxation while touring the show.

We'll be looking forward to greeting you.

BOOTH NO. 99-101, 116-118 KANSAS BUILDING

REPUBLIC SUPPLY COMPANY

Republic Supply
COMPANY

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REPUBLIC STEEL

General Offices Oklahoma City, Oklahoma

More than 477,000 horsepower of

CENTRIFUGAL COMPRESSORS

for NATURAL GAS SERVICE

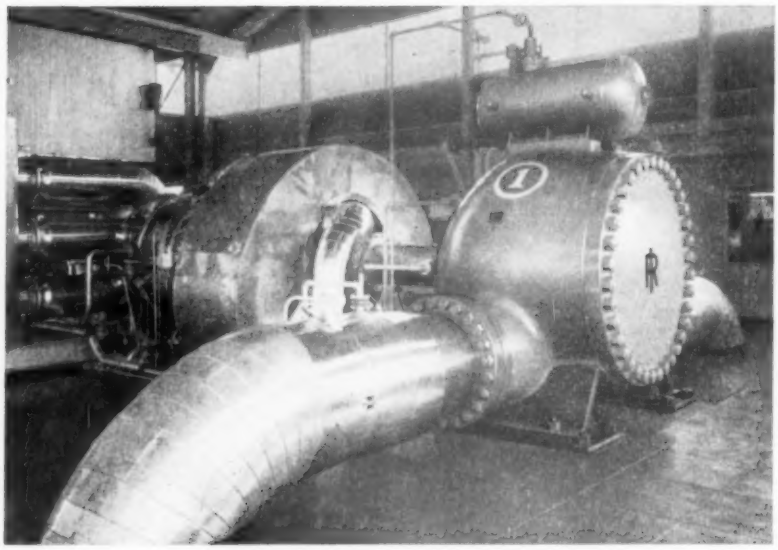
I-R *"FIRSTS"* in Centrifugal Gas Compressor History

FIRST CENTRIFUGAL PIPE-LINE COMPRESSOR Built by Ingersoll-Rand in 1931, this centrifugal pipe-line booster consists of a six-stage compressor driven by a 3550 rpm, 3000 hp motor, all encased in a pressure vessel.

FIRST COMMERCIAL APPLICATION of centrifugal pipe-line compressors was made in 1947. A total of 78 electric-motor-driven, single-stage I-R centrifugals were installed, to handle approximately 250 mmcfd.

FIRST GAS-TURBINE-DRIVEN UNIT Installed in 1949, this Ingersoll-Rand centrifugal compressor, powered by an 1850 hp simple cycle combustion gas turbine, was the first gas-turbine-driven centrifugal compressor developed and applied to pipe-line service, and was designed for a flow of 192 mmcfd at a ratio of 1.18.

FIRST 2000 PSI CENTRIFUGAL GAS COMPRESSOR This Ingersoll-Rand 5000 hp double-case centrifugal compressor was the first unit ever built for handling natural gas at a discharge pressure of 2000 psi.



One of 12 Ingersoll-Rand centrifugal compressors on a large natural gas pipe-line.

This experience means MAXIMUM DEPENDABILITY in modern pipe-line service

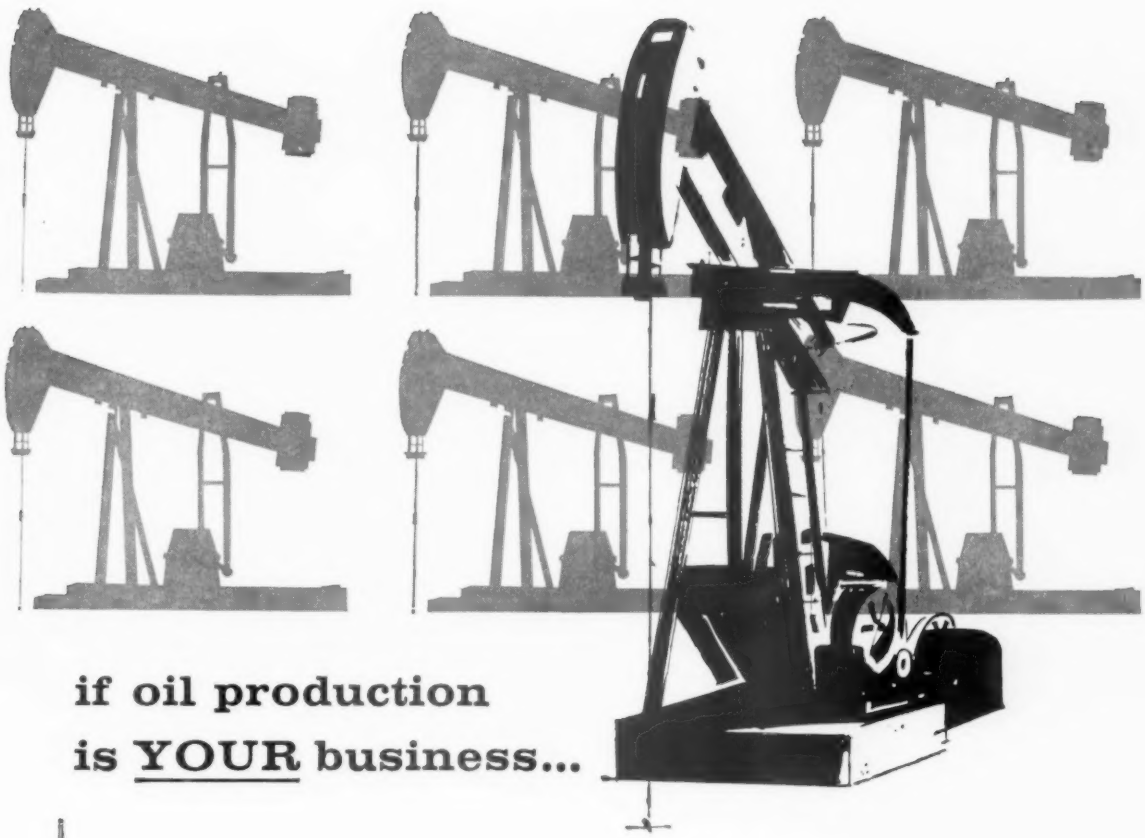
FROM the very first pipe-line installation, Ingersoll-Rand has pioneered in the development of centrifugal gas compressors for higher and higher capacities and pressures. And every step of the way, dependability of performance has been a prime consideration in every detail of design and construction. This is why more I-R Centrifugal Compressors have been sold for natural gas service than any other make . . . . a total exceeding 477,000 hp for this service alone.

Backed by such long and successful experience, the modern I-R centrifugal gas compressor is your best assurance of trouble-free performance and long-range economy in gas transmission service.

Ingersoll-Rand

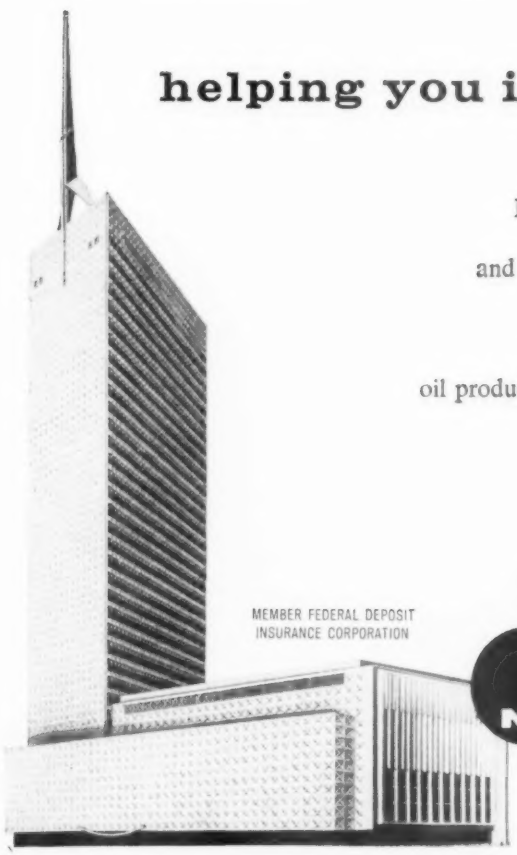
12-736 11 Broadway, New York 4, N. Y.

COMPRESSORS • AIR TOOLS • ROCK DRILLS • TURBO-BLOWERS • CONDENSERS
CENTRIFUGAL PUMPS • DIESEL AND GAS ENGINES



if oil production is YOUR business...

helping you is OUR business



Here, at Republic National Bank, the combined experience and proved performance of the South's largest and most active Oil Department are concentrated on better service to the oil producer. However complex your production financing problem, you'll get expert attention to your requirements at Republic. How may we help you?

ADDED STRENGTH YOU CAN BANK ON

MEMBER FEDERAL DEPOSIT INSURANCE CORPORATION

REPUBLIC National BANK of Dallas

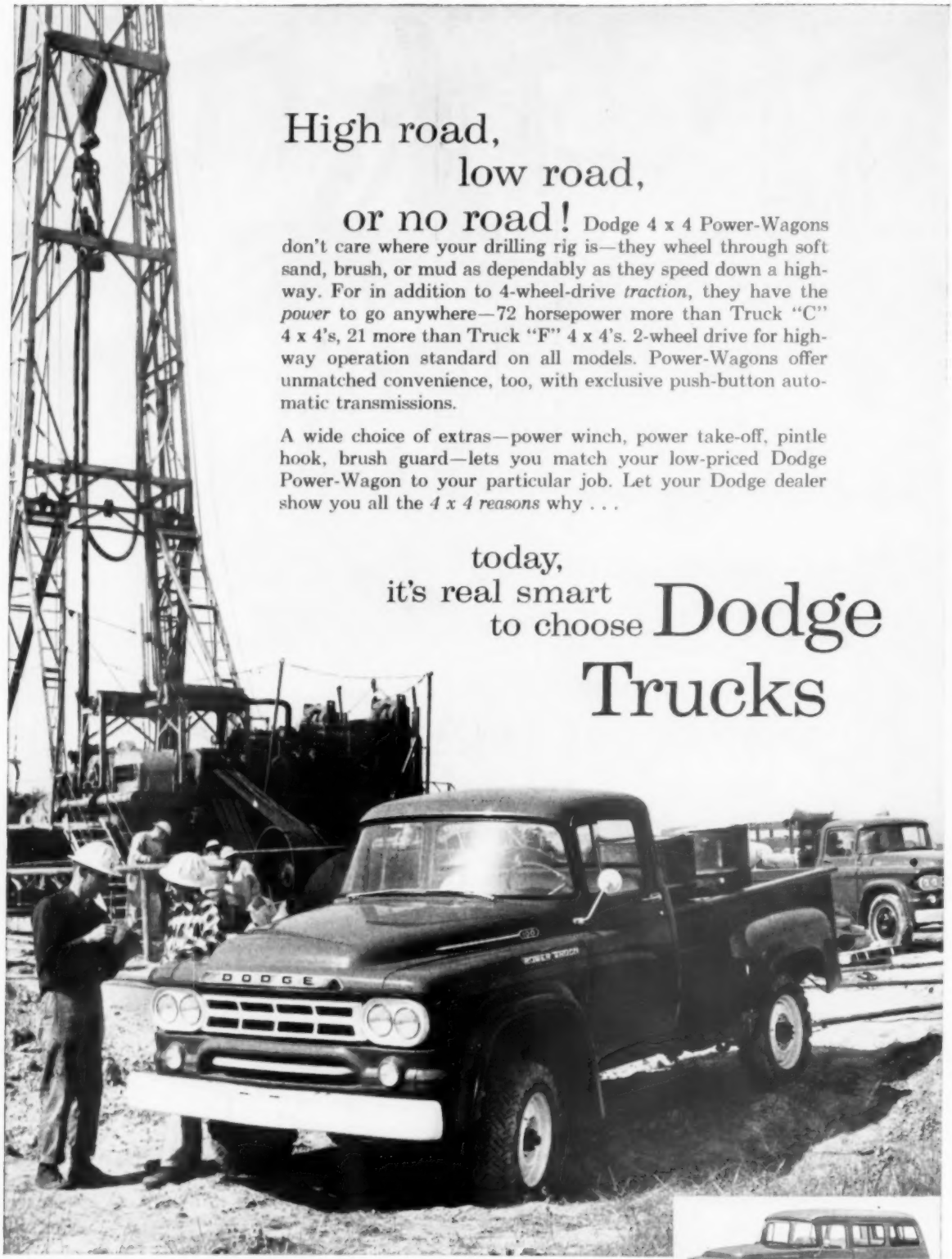
CAPITAL AND SURPLUS $100,000,000
LARGEST IN THE SOUTH

High road, low road, or no road!

Dodge 4 x 4 Power-Wagons don't care where your drilling rig is—they wheel through soft sand, brush, or mud as dependably as they speed down a highway. For in addition to 4-wheel-drive *traction*, they have the *power* to go anywhere—72 horsepower more than Truck "C" 4 x 4's, 21 more than Truck "F" 4 x 4's. 2-wheel drive for highway operation standard on all models. Power-Wagons offer unmatched convenience, too, with exclusive push-button automatic transmissions.

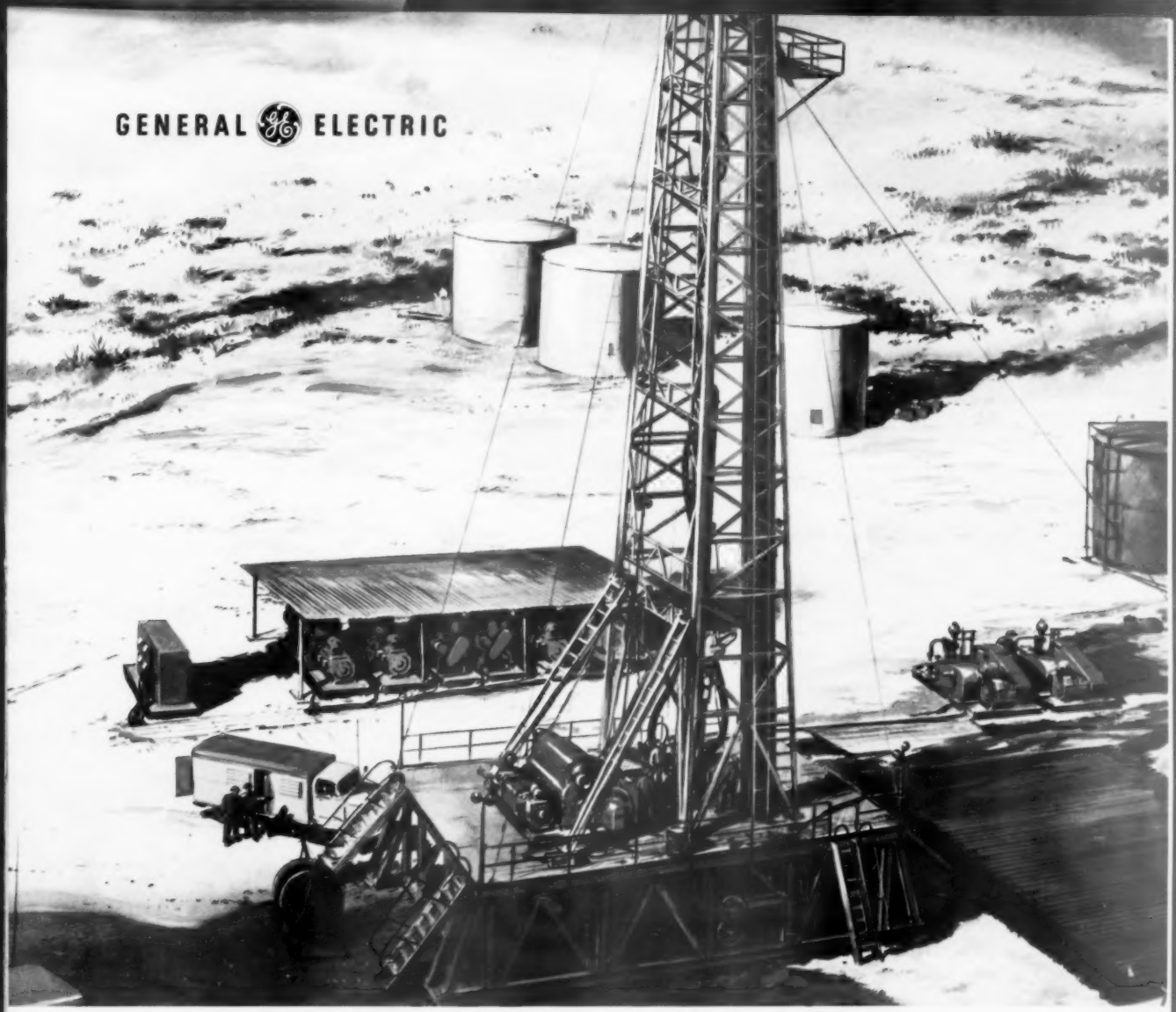
A wide choice of extras—power winch, power take-off, pintle hook, brush guard—lets you match your low-priced Dodge Power-Wagon to your particular job. Let your Dodge dealer show you all the *4 x 4 reasons* why . . .

today, it's real smart to choose Dodge Trucks



Complete line, for passengers or payload! Dodge offers 4 x 4 Power-Wagons for every use: roomy Town Wagons . . . stakes . . . pick-ups . . . chassis cowls or cabs for special truck bodies . . . even extra-rugged "military" model Power-Wagons! Two V-8's, three Sixes. G.V.W.'s up to 20,000 lbs.

SEE OUR EXHIBIT—AREA 118—AT THE OIL SHOW



G-E Electric Drive Increases Drilling Profit

THE PROVEN EFFICIENCY OF G-E ELECTRIC DRIVE INCREASES PROFIT BY REDUCING DRILLING COSTS

Easy Portability reduces transportation costs. Electric drive components can be separated into lightweight, compact loads.

Rig-up Time is Greatly Reduced because mechanical alignment is eliminated . . . you simply "plug in" electric drive.

Maintenance Costs are Reduced because electric drive requires only a minimum of attention. Replacement of cumbersome mechanical compounds with electric drive virtually eliminates transmission down time.

Site Preparation is Simplified and costs are reduced because mud pumps and engines can be located where convenient.

Spare Parts for Transmission are Virtually Eliminated by electric drive. Operators report that the parts problem is negligible with reliable electric drive.

Greater Personnel and Rig Safety is provided by electric drive. The uncluttered drilling area is free of engine noise and vibration. The possibility of fire loss is lessened because of the remote location of a major part of the rig equipment.

For More Information on how the cost advantages of electric drive can increase your drilling profits, contact your nearest G-E Apparatus Sales Office or send in the coupon below.

See our exhibit at the International Petroleum Exposition in Tulsa, May 14-23.

Section 115-30
General Electric Company
Schenectady 5, N. Y.

Please send me your new 4-color bulletin giving more information on G-E Electric Drive for oil well drilling.

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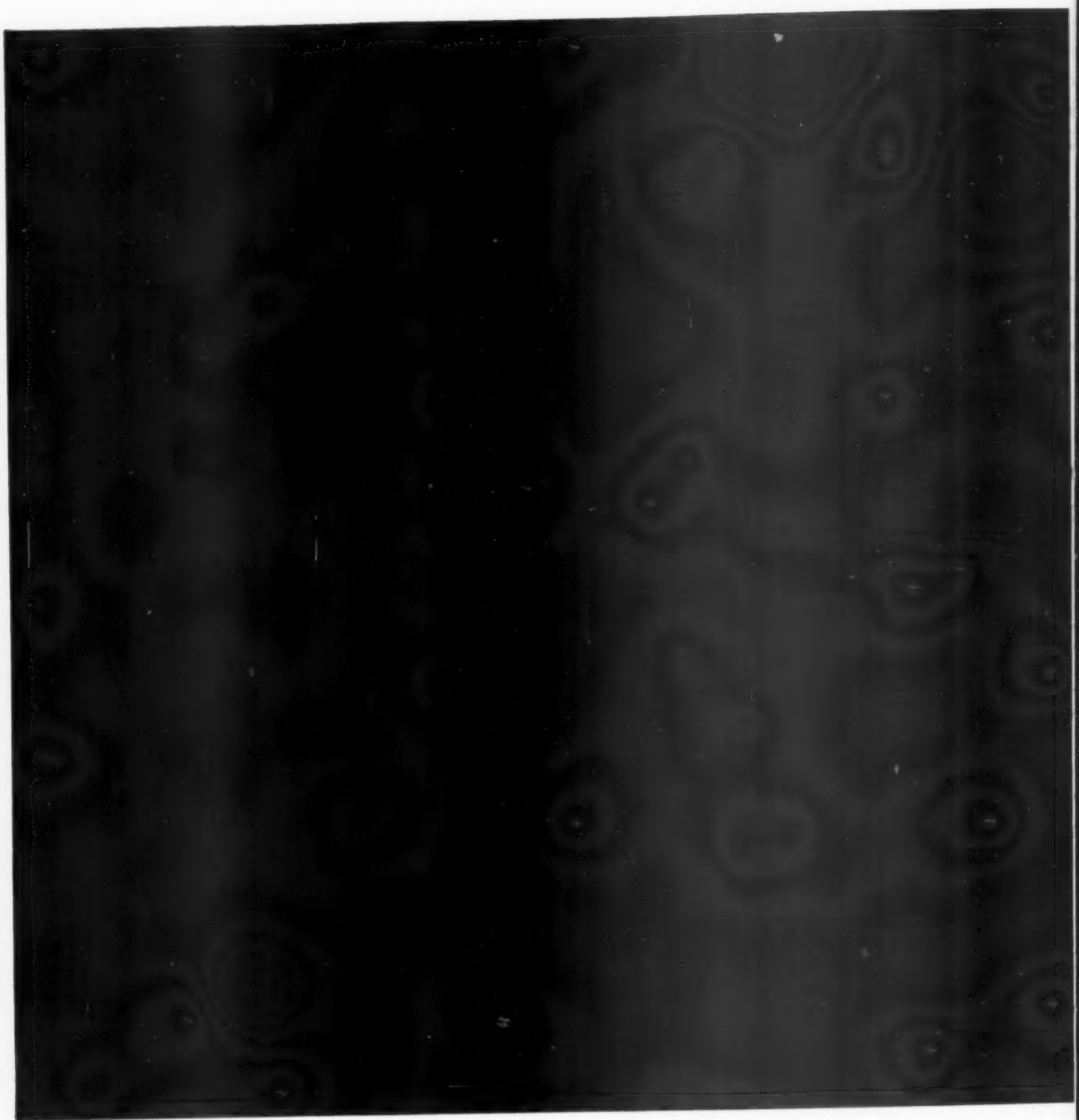
COMPANY POSITION

STREET

CITY STATE

GENERAL ELECTRIC



THE 69½ FEET THAT REACH THE MOON

See our exhibit at the International Petroleum Exposition in Tulsa, May 14-23.

From a hole no deeper than that, drilled in Pennsylvania 100 years ago, have come endless miracles of oil.

Today, petroleum gives us fuels that are capable of moving man from earth to the moon and beyond. Such explorations can bring new knowledge of incalculable value.

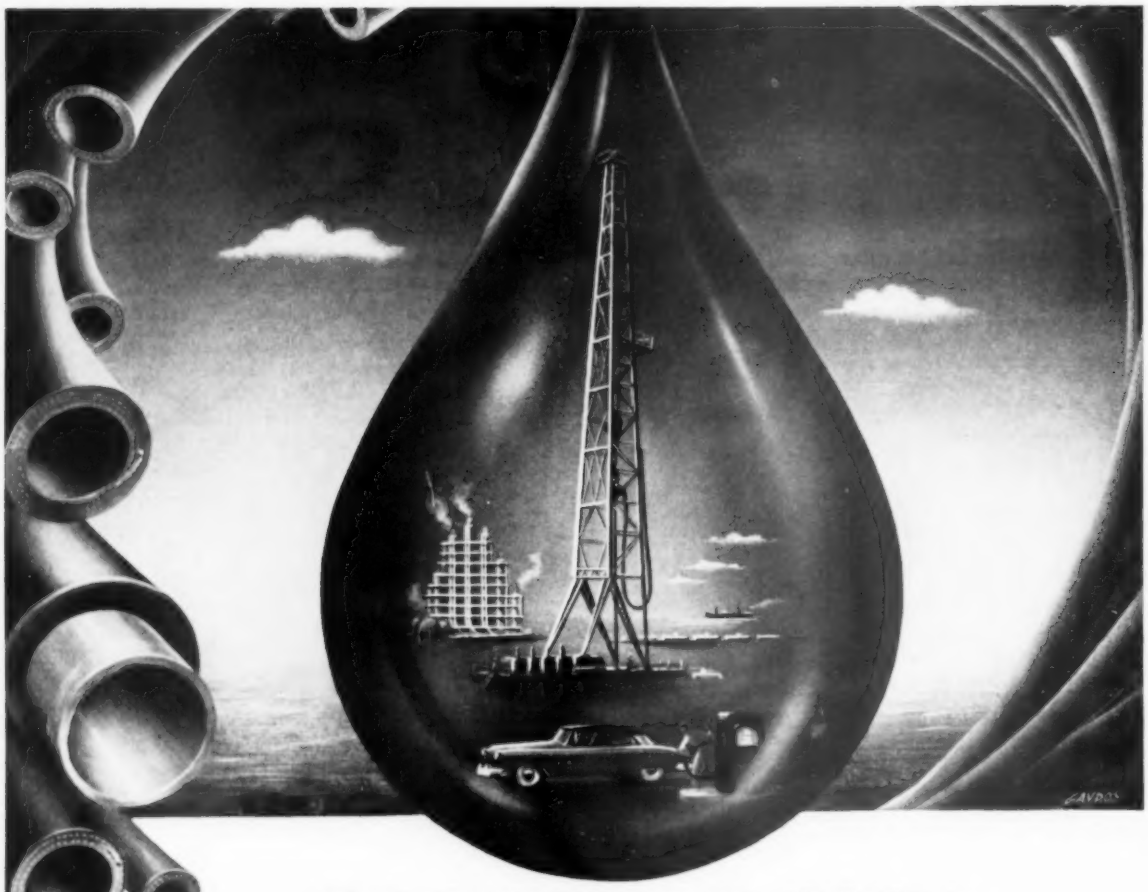
But no less certain than that we will one day fly through space is that we will have ever better fuels and lubricants for travel on the ground, on the sea and in the air – new and exciting products for the farm, industry and the home.

Today one quarter of all the money spent by U.S. industry on research is spent by the petroleum industry.

And as chemists study the endless ways to re-arrange oil molecules to make useful products, we can see that the age of petroleum has only begun.

Standard Oil Company (New Jersey) Esso

OIL'S FIRST CENTURY
BORN IN FREEDOM
WORKING FOR PROGRESS



From drilling to driving... HEWITT-ROBINS HOSE CUTS HANDLING COSTS

Whatever your hose need . . . whether it's hose for a drilling rig . . . hose to load and unload tankers or tank cars . . . hose to feed fuel to factories, homes or automobiles . . . your Hewitt-Robins distributor can supply you with the right answer.

In all phases of the petroleum industry . . . drilling, processing, refining, and distributing . . . wherever hose is essential, Hewitt-Robins is recognized as a pioneer. Today we make over 100 different types of specialized hose for petroleum products alone . . . latest members of this famous line are a new rotary drilling hose, and a new LP gas reel hose for bulk delivery trucks. Hewitt-Robins also provides the petroleum industry with hose for handling air, steam, water, mud, and chemicals . . . and for fighting fire.

For immediate information regarding specific types of petroleum hose, or any kind of industrial hose, contact your local H-R distributor or write Hewitt-Robins, Stamford, Connecticut. Ask for Bulletin 5-20.

HR HEWITT-ROBINS

OIL'S FIRST CENTURY
BORN IN FREEDOM
WORKING FOR PROGRESS

THE NAME THAT MEANS EVERYTHING IN BULK MATERIALS HANDLING SYSTEMS . . .

CONVEYOR BELTING AND IDLERS • POWER TRANSMISSION DRIVES • INDUSTRIAL HOSE • VIBRATING CONVEYORS, SCREENS & SHAKEOUTS

For 50 years Hughes has pioneered every advance in cone-type rock bits

Starting with the first Hughes bit in 1909, that introduced the principle of rolling conical cutters, every major breakthrough in cone-type rock bit design has been pioneered by Hughes.

And for three very significant reasons:

1) A first-hand knowledge of the needs of the industry gained in the field.

2) A continuing research program devoted to improving rock bit performance and drilling techniques.

3) The industry's greatest experience in designing and manufacturing rock bits.

Today, you can look to Hughes, as the industry has for 50 years, for leadership in developing rock bits that will enable you to get maximum performance out of your drilling equipment.

HUGHES TOOL COMPANY

50TH ANNIVERSARY YEAR 1909 – 1959

Hughes FLASH-WELD is now 21

At 21, Hughes "Flash-Weld" is the most experienced welded tool joint-to-pipe connection in the oil fields.

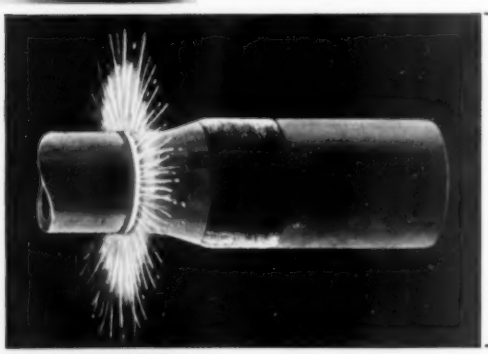
Since 1938, when Hughes introduced the first flash-welded drill string, *more than 40 million feet* of drill pipe have been unitized by the "Flash-Weld" process.

A new heat treating process has *more than doubled* the tension impact strength of "Flash-Weld" pipe connections. And new processing controls are improving the quality of the finished drill strings.

In addition to exacting physical tests, "Flash-Weld" tool joints and flash-welded connections undergo a series of critical inspections. For instance, after flash-welding, all weld areas are subjected to magnetic particle inspection. The critically-stressed areas of the tool joints themselves (this applies to all Hughes joints) are magnetically inspected. And the hardfacing on the joints is "snow" tested to check the bond of the hardfacing material to the joints.

The Hughes method of hardfacing, plus Hughes' specially developed tungsten carbide hardfacing material, assures maximum protection against wear during the life of the joints.

FLASH-WELD
A DEVELOPMENT
OF
HUGHES
TOOL COMPANY
HOUSTON, TEXAS



Complete line of "Flash-Weld" joints is available for attachment to new API LIGHTWEIGHT drill pipe, as well as standard weight pipe. Ask your Hughes man.

"Flash-Weld" joints are available with tapered and square shoulders

VISIT BAROID BOOTH AT TULSA!
MAY 14-23, OKLAHOMA BUILDING
BAROID BOOTHS 83-84, 127-128

BAROID

BAROID

BAROID DIVISION • NATIONAL LEAD CO.
Main Office: P. O. Box 1675, Houston 1, Texas

BAROID:

your assurance of mud success . . . from the beginning

Today, as on their first job in 1928, Baroid gives you fast, DIRECT service: engineering by Baroid's own field men; prompt delivery of quality products from Baroid's own stores. In materials or men, Baroid got there first and got the best — for you . . . and still does!

Good Wells Make Good News

A Monthly Report on Wells That Are Now Worth More

May 15, 1959

When difficulty is expected in getting a good primary or remedial cementing job, many operators find it pays to turn to Cealment®, the Dowell-developed latex-cementing service. Here are four examples of successful jobs:

- **Southern Saskatchewan, Canada** (Old Oil Well) This well had been completed into the Midale beds and the Frobisher. To prevent possible channeling between zones, the operator specified Cealment to tail in the long string. 300 gallons of latex-cement were used. When production declined to 30 bopd on pump, the operator ordered Acid Petrofrac® for the Midale beds only. Dowell treated at 1550 psi maximum. Despite the fact that there was only 50 feet between zones, there was no communication. Production rose from 30 bopd pumping continuously to 47 barrels of oil in 12 hours flowing (daily allowable).

- **Harrison County, East Texas** (New Oil Well) This well was producing gas but no fluid. Completion was through four sets of perforations between 5924 and 6028 feet. Well was killed, and Dowell squeezed the gas section with Cealment. Well was then fractured with Sandfrac® — Dowell injected 600 barrels lease oil and 17,000 pounds sand at 18 bpm. Production increased from zero to 120 bopd.

- **Calcasieu Parish, South Louisiana** (Old Oil Well) Water intrusion had stopped oil production. It was decided to squeeze perforations from 9671 to 9678 feet to shut off water, and to circulate out excess cement to avoid drilling out. A small pulling rig was used. Dowell squeezed with Cealment using 700 gallons latex-cement. After 15 minutes of holding 4400 psi, seal nipples were lowered through packer and excess cement was reversed out. Operator re-perforated to regain production. A considerable saving was made because drilling-out was avoided. The pulling rig was used for only three days.

- **Kay County, Oklahoma:** This well was completed through perforations from 3742 to 3758 feet into the Skinner sand. After fracturing, it went to water. Survey indicated that water was coming up through channels in the cement from about 3800 feet. The use of Cealment was indicated. Dowell displaced 288 gallons latex-cement before squeeze pressure reached the 1900 psi limit. Well was shut in 48 hours, then drilled out, re-perforated, and fractured with Petrojel®. 60 days after treatment, well was pumping 22 bopd with no water.

The latex-cement used in Cealment is tough and strong. It resists contamination and has excellent sealing qualities. For full information on how it can be used in your well, call any of the 165 Dowell service points. In Canada, call Dowell of Canada, Ltd.; in Venezuela, United Oilwell Service. Dowell, Tulsa 1, Oklahoma.

Services for the oil industry DOWELL
DIVISION OF THE DOW CHEMICAL COMPANY

60-Second Summary / WHAT'S HAPPENING IN OIL

May 15, 1959

dept/INDEX

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More changes appear in the making on import controls. In addition to possible revisions of residual quotas, the 10% limit on unfinished oil imports to the West Coast may be modified. Then what? Guessing centers on asphalt crudes. . . . p. 38

•

Greater power, speed, and control feature the new equipment at the Tulsa exposition this week. It's the biggest single-industry show ever held. . . . p. 31

•

Footage drilled in the U.S. may top 1958 by as much as 10%. That's a new estimate, based on the better-than-seasonal pickup in activity in most areas. . . . p. 35

•

Drilling in Arizona may set a record this year. Shell Oil's recent completion in the northeast part gives the state its second producer, stirring new interest. . . . p. 49

•

The oil industry, a hearty 100 years old, still has its best years to come. Fifty top oil men, contributing to Petroleum Week's special Centennial Forecast, unanimously hail the coming half-century as oil's "era of efficiency." . . . p. 78

•

Oil marketers say that some new-car gasoline and oil economy claims just aren't so. They contend that premium fuels and 1,000-mi. oil changes are necessary for most new cars, despite car-maker claims. . . . p. 146

•

Oil men are asking for more attractive leasing terms for the Canadian Arctic. Unless current rules are relaxed, they say, development of the 250,000-sq. mi. area can be kissed goodbye. . . . p. 36

•

Pipeline design is in for some important changes, thanks mostly to increasing operating experience, which shows how problems can be avoided in coming lines. . . . p. 154

•

Rotating disc contactors are the newest technique applied in U. S. lube oil refining. The first unit will be placed on stream at Shell's Wood River (Ill.) refinery. . . . p. 137

•

Recoverable reserves in Saudi Arabia jumped 1.8-billion bbl. last year, reaching an estimated 36.7-billion bbl. Production in the country was up slightly—by 2.3%. . . . p. 164

•

At midsession, Congress has been easy on oil, but depletion is still due for a test vote. And Congress may leave imports alone. . . . p. 46

Up to the Minute / SIGNIFICANT LATE NEWS

AT-A-GLANCE PETROLEUM WEEK

May 15, 1959

Tennessee Gas Transmission finally received Federal Power Commission approval this week to enter the Midwest. Tennessee and its affiliate, Midwestern Gas, can spend $112.3-million to move 360-million cf/d to the Chicago-Gary area from Texas and Louisiana. FPC disapproved earlier plans to use some Canadian gas.

But FPC said a proposed 7% rate of return was "obviously too high," and trimmed Midwestern's return to 6¼%. It O.K.'d a 22¢-per-Mcf. field price, subject to revision in one year.

FPC also approved an increase in El Paso Natural's West Coast Service, but was asked to deny Transwestern's California line. El Paso was authorized to spend $24-million to boost capacity by 100-million cf/d to two Southern California utilities.

The recommendation to oppose the Transwestern line from New Mexico was based on price and available supply. An FPC counsel said the plan to pay producers from 16¢ to 23¢ per Mcf. for gas was "contrary to the public interest," since El Paso pays only 16¢ in the Permian Basin area.

•

The Celler subcommittee will issue a majority and a Republican minority report on Justice Dept. "consent" decrees about June 2. The House group disagreed on some aspects of its study of the decrees, including shipper-owned pipelines.

•

Jersey Standard is increasing its interest in Libya. In addition to its own concessions, it will acquire, if the government approves, an undivided 50% interest in three concessions of Libyan American Oil in exchange for a $6-million exploration expenditure. Libyan American is owned by Texas Gulf Producing (51%) and W. R. Grace (49%).

•

D-X Sunray Oil Co. will add a $7-million solvent dewaxing plant at its Tulsa refinery. The unit will be built adjacent to existing lube facilities, and will replace three dewaxing plants, boosting wax capacity to 70-million lb. annually.

•

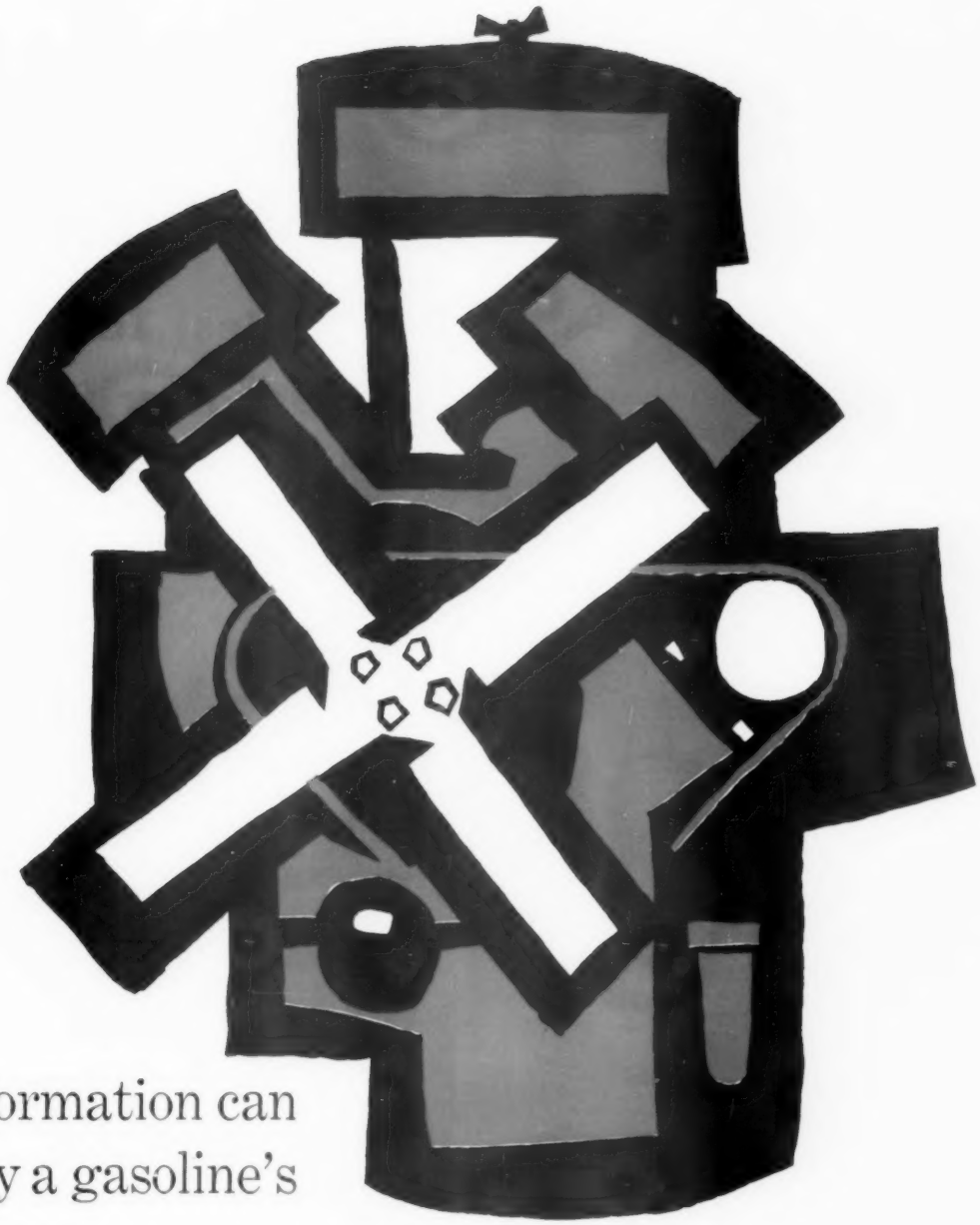
President Eisenhower reiterated his demand this week for a 1½¢ boost in federal gasoline taxes. But Congress still appears strongly opposed to such a hike.

•

El Paso Natural Gas will supply 937,000 bbl. of LPG for miscible-phase injection in New Mexico's Bisti field. The recovery program will last about five months at a rate of 7,000 b/d in ten wells.

•

Paul E. Taliaferro was elected president and chief executive officer of Sunray Mid-Continent Oil Co. He succeeds W. C. Whaley, who becomes eligible to retire May 1, but will become executive committee chairman.



gum formation can destroy a gasoline's good name... protect yours with **Tenamene**

Eastman gasoline additives

Why Tenamene? *Because* the Tenamene line offers you every principal type of gum inhibitor in commercial use today.

Because Eastman, as a basic manufacturer of the additives it supplies, maintains complete and precise control every step of the way, assuring you of a uniform product and consistent additive performance.

Because Eastman petroleum specialists are available for on-the-spot technical service to make absolutely certain you obtain the most efficient use of the additives you buy. Talk to them, for example, about the economy of bulk delivery.

You'll find Eastman petroleum specialists can give you unequaled technical service because inhibition of gum formation is their only interest. EASTMAN CHEMICAL PRODUCTS, INC., subsidiary of Eastman Kodak Company, KINGSPORT, TENNESSEE.

SALES OFFICES: **Eastman Chemical Products, Inc.,** Kingsport, Tenn.; Atlanta; Chicago; Cincinnati; Cleveland; Detroit; Framingham, Massachusetts; Greensboro, N. C.; Houston; New York City; St. Louis. **West Coast: Wilson Meyer Co.,** San Francisco; Denver; Los Angeles; Phoenix; Salt Lake City; Seattle.

HOW BIT
BitLubs
40 POUNDS
In a West Texas Well,
Magcobar Engineers
put a film
here.....
Another Well Done with

LUBE AND MAGCOBAR ENGINEERING CUT DRILLING COSTS

You are always sure of getting every cost-cutting advantage with Magcobar. Here's why: The Magcobar Mud Engineer combines a thorough knowledge of drilling fluid chemistry with experience in your drilling area. This background—plus the top mud lab in the country—gives new dimension to the finest and most complete line of drilling mud products. What does this mean to you? The highest level of product performance to cut your drilling costs.

..... to make net savings of $4.87 per foot

Here's proof of actual savings using Bit Lube (E. P. Additive for Mud). The table below shows a drilling cost comparison in the Brownfield, Texas, area. The Bit Lube well was drilled for $4.87 per foot less than the offset well.

	NO. BITS	BIT SIZE	INTERVAL	ROTATING HOURS	WEIGHT ON BIT	RPM
BIT LUBE-WATER	28	7⅞"	4919-7272	185	70-90,000	60-80
WATER	40	7⅞"	4936-7270	379	45-60,000	55-60

Total savings in bits, trips, and drilling time was $13,420. Bit Lube and emulsifiers cost $1,940; a net saving of $11,480!

Bit Lube forms a tough protective film to reduce friction and to increase bit bearing life under extreme pressure conditions. It works best with high weight on the bit and fast rotary speed. Bit Lube and Magcobar engineering may be the answer to your bearing failures.

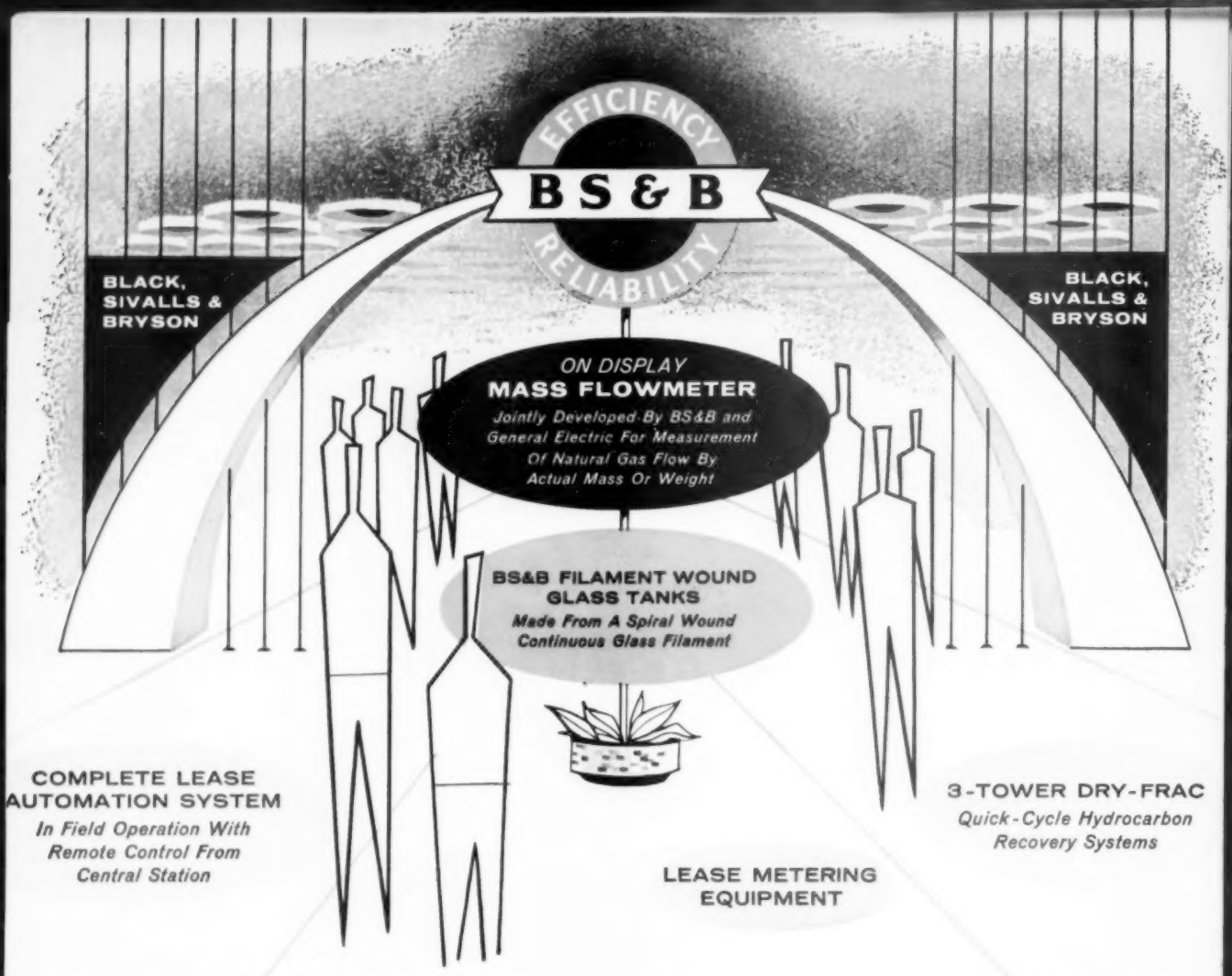
Bit Lube is only one of Magcobar's many answers to the problem of high drilling cost, a problem that demands the right answers. You'll find that the right products *used right* by Magcobar can cut costs on your next well, too.

Magcobar
Complete
DRILLING MUD SERVICE

MAGNET COVE BARIUM CORPORATION
HOUSTON, TEXAS

59-200

Magcobar Technology!


EFFICIENCY
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RELIABILITY
BLACK, SIVALLS & BRYSON
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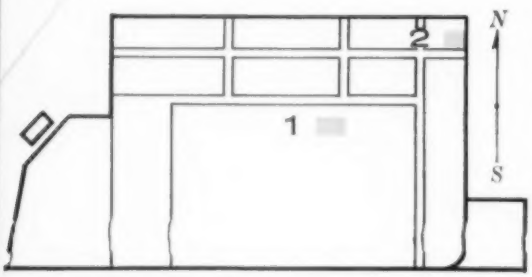
ON DISPLAY
MASS FLOWMETER
Jointly Developed By BS&B and General Electric For Measurement Of Natural Gas Flow By Actual Mass Or Weight
BS&B FILAMENT WOUND GLASS TANKS
Made From A Spiral Wound Continuous Glass Filament
COMPLETE LEASE AUTOMATION SYSTEM
In Field Operation With Remote Control From Central Station
3-TOWER DRY-FRAC
Quick-Cycle Hydrocarbon Recovery Systems
LEASE METERING EQUIPMENT

VISIT BS&B AT THE OIL SHOW!

Tulsa, Oklahoma • May 14-23

SKID-MOUNTED WELLHEAD GAS PROCESSING UNITS



BS&B at the Oil Show: (1) California Building (2) Block 208, North Area

Included as a "first showing" will be the revolutionary new mass flowmeter for natural gas measurement by actual mass or weight . . . and a completely new type of tank made from a spiral wound continuous glass filament.

Also featured will be a BS&B lease automation system in operation. At BS&B's North Area exhibit (Block 208), you will see lease operations being performed automatically, with remote control from well test and LACT programmers located at a central station in our California Building exhibit. Many other products in the fields of gas processing, lease automation, liquid level, pressure and flow control will also be on display.

Be sure to visit BS&B at both locations!

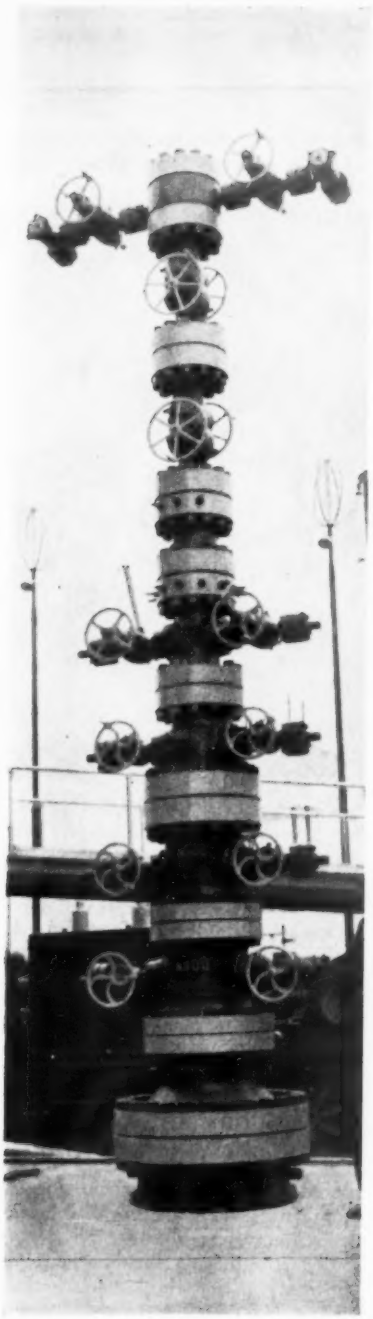
BLACK, SIVALLS & BRYSON, INC.

Product Research and Development to Meet the Industry's

NEEDS OF TODAY AND TOMORROW

Oil's Tools Tougher and Sharper

$500-million in equipment at Tulsa oil exposition strengthens trend to greater power, flexibility, speed and control. More than 30,000 oil men expected at show.



CHRISTMAS TREE of National Supply Co., 23 ft. high, is for use offshore with working pressures up to 10,000 psi.

Most of the new tools and technological knowhow that make the oil industry great are assembled in Tulsa this week at the International Petroleum Exposition, the largest single-industry show ever staged.

Represented is $500-million worth of the most modern oil equipment, displayed on a 30-acre site.

Featured by the 1,800 companies that have spent $15-million to prepare exhibits are new and improved drilling rigs, pumps, bits, wellhead assemblies, well-service tools, rolling stock, and tank-gauging and tank-cleaning devices—plus dozens of other kinds of equipment used in all oil operations.

The industry's latest scientific advances in processing and research are shown in exhibits and demonstrations.

The full display is now being seen by the early arrivals among the 30,000 buyers, specifiers, and users of oil equipment who will visit Tulsa during the May 14-23 show. Included will be 2,000 foreign oil men.

Much of the equipment is being shown publicly for the first time.

Improvements in drilling rigs are one of the highlights of the show, with the accent on power and streamlining.

Gardner-Denver Co.'s brand new 2,100-hp. drawworks (picture, page 33) is designed to drill from 15,000 ft. down to the deepest holes now being considered, using large drill pipe and the most powerful pumps made. The 36x60-in. drum is one of the largest on the market. Hoist and transmission are combined in a one-piece unit for ease in moving and rigging up without breaking chains or air and oil lines.

National Supply Co. has rigged up and running for the first time its new "helicopter rig" (picture, page 32), designed to be carried by air to inaccessible areas. Built for depths to 10,000 ft., the rig is powered by four General Motors engines. The slush pump has a maximum input of 220 hp. at 70 strokes a minute. The drive group forms one unit, and the drawworks another. The weight of each is below the 4,000-lb. load limit for helicopter transportation.

White Motor Co.'s Diesel Engine Division is adding to its line a diesel power unit for heavy-duty oil field drilling. The engine has a space-saving turbocharger arrangement that gives a compact unit of 450-550 hp. capacity. An open-chamber combustion system increases fuel economy. Link-Belt Co. is unveiling a new line of spherical roller bearings used in oil field power transmission.

Several new electric-drive systems for drilling rigs give greater flexibility.

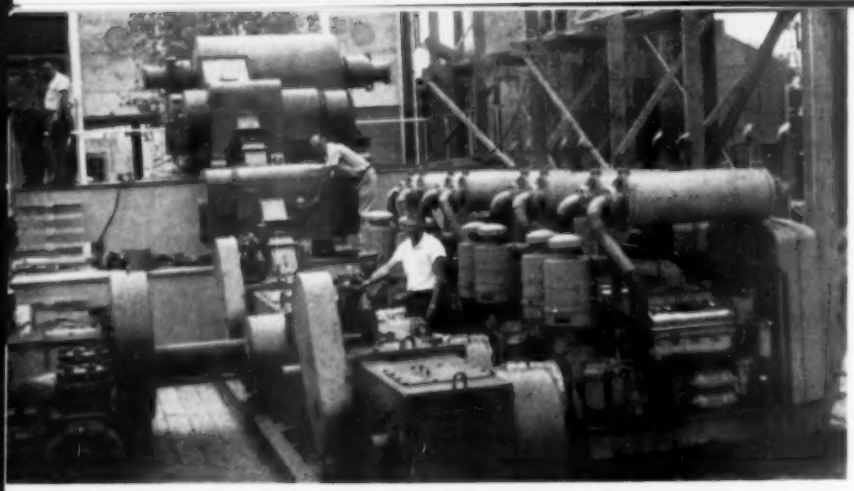
Being shown for the first time by Electro-Motive Division of General Motors is a simplified diesel-electric power package for medium-depth oil drilling and work-over rigs. A complete electric-drive system is matched with a 500-hp. General Motors twin 110 diesel engine for smaller rigs. The electric transmission and control equipment is adaptable to natural gas engines.

A new line of motors and generators in most horsepower ratings is being offered for rig drives by Reliance Electric & Engineering Co. Designed to be transported by air, the electric-drive system is a packaged unit, with plug-type connectors for cables. The units may be used singly or in tandem with diesel, LPG, gas-turbine, or free-piston prime movers.

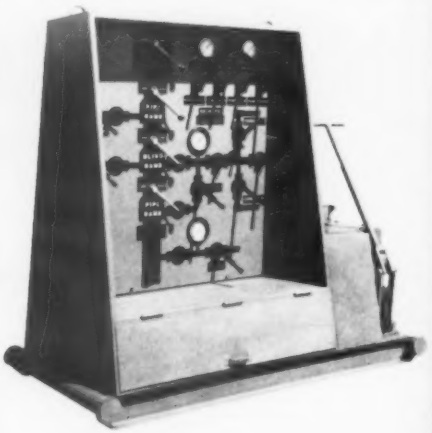
A new all-purpose model is a feature of the oil-field pump displays. A 650-brake-hp., plunger-type pump, designed for many work conditions on and around the drilling rig, is being shown by Gardner-Denver Co. With minor modifications, the pump is adaptable to mud-servicing, cementing, casing-testing, well-servicing, fracturing, and workover operations. With 5-in. plungers, the pump has a maximum throughput of 483 gal. per minute at 130 rpm.

Gardner-Denver also is showing another pump designed for the same purposes, but with 300 brake hp.

Exhibited with National Supply's recently introduced Type 1625-DE



HELICOPTER RIG of National Supply Co., which limits unit weights to less than 4,000 lb. for air transportation, is shown rigged up for the first time at Tulsa.



BLOWOUT preventer control is centralized by Cameron Iron Works' panel.

CEMENTING TRUCK being introduced by Halliburton has two pumps delivering more than 260 hydraulic horsepower each. New Densometer and Densitroler devices for weighing and controlling cement slurry swing out from left side of truck about half way back.

consolidated rig, which has a depth range of 16,000 ft. to 25,000 ft., are two new slush pumps having maximum inputs of 1,250 hp. and 700 hp. at 65 strokes a minute.

Wheland Co. has a new 16-in. slush pump featuring a planetary gear system. To apply power to the pump, Wheland has a shaft that carries the full weight of the sheave and the pull of the belts. Inside the shaft is a floating pinion shaft that drives the pump, so that no sheave weight or belt pull is transmitted to the gears.

The effectiveness of drilling muds and bits is improved with new specialty products being exhibited.

Magcobar, for example, is demonstrating three new products. One is an all-purpose dispersant, Spersene, for drilling muds.

The company's new Bit Lube imparts extreme-pressure lubricating properties to drilling fluids. And Magcobar's new Blok Buster is an oil wash concentrate to improve oil production by removing formation blocks.

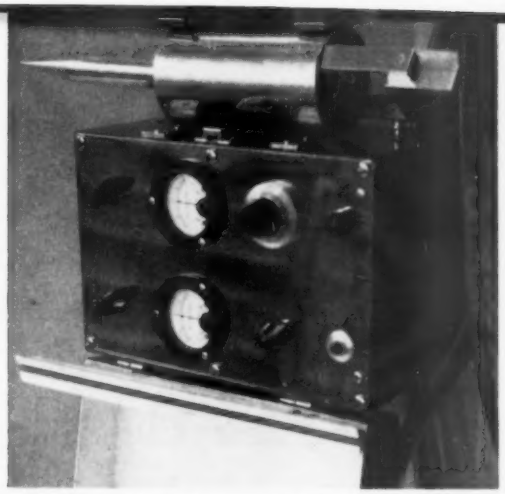
Two recently developed Y-bit types are being shown by Reed Roller Bit Co. These are the YC-3 Cobra tungsten-carbide insert bit, which is proving itself in air drilling, and the YVC bit, which has a combination of the teeth and tungsten-carbide inserts.

Displayed at Tulsa after recent simulated tests is the new rock bit lubricator sub of H. C. Smith Oil Tool Co. The sub will undergo field tests soon to prove its effectiveness in extending the life of the bearings for the life of the bit.

Additional safety factors are being shown in blowout preventers.

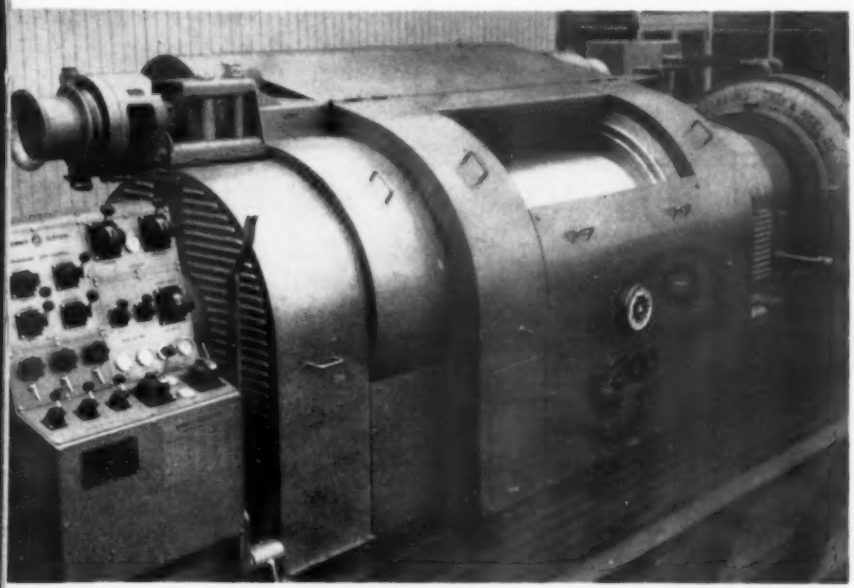
Cameron Iron Works has a hookup that includes a recently developed graphic control panel (picture, above) and a new system that has the operating mechanism always balanced to pressure. As a result, closing or opening pressure is very low. The panel's graphic designation of controls reduces the danger of operating the wrong control. And all controls are at one station.

Stewart & Stevenson Distributing Co. is showing its recently introduced 3,000-lb. hydropneumatic accumulator system for use on blowout preventers. By raising the pressure to 3,000 lb., the system has increased efficiency in that the last usable drop of fluid coming out of the accumulator system is at 1,000 lb. For preventers that can't take more than 1,500 lb. on a hydraulic system, a



TANK GAUGER of Instruments, Inc., is battery-powered. Eliminating sampling, it gauges tank in 15 minutes.

PUMPING JACK of Oilfield Equipment Corp. of Colorado, shown before show, features compactness and elimination of the Samson post.



2,100-HP. DRAWWORKS of Gardner-Denver Co., designed for drilling below 15,000 ft., has 36x60-in. drum, one of the largest of any drawworks now operating.

TANK CLEANING is eased by new Dowell tool with rotating jet-nozzles.

new pressure-reducing valve has been designed.

Several new field service rigs stress mobility. Among them is a self-contained unit of Bucyrus-Erie Co. for servicing wells to 12,000 ft. A compact unit with highway mobility, it has a butane-burning, heavy-duty engine. The drawworks' features include multispeed and interchangeable sand line drums, and self-equalizing mechanical brakes.

Another Bucyrus-Erie rig is a truck-mounted table-drive, rotary drill for exploration and seismograph prospecting. It will drill 4¼-in. to 5⅝-in. holes to 1,000 ft.

The trend to compactness in wellhead assemblies is evident at the show.

Headlining the display of Oil Center Tool Co. is the company's recently developed unitized Christmas tree, the Unitree. It features savings in weight and installation time, and easily replaceable valve segments. Built-in valves eliminate joints and flanges, minimizing leakage hazards.

The 23-ft. Christmas tree exhibited by National Supply Co. (picture, page 31) illustrates the new type of giant well-head assemblies being required for offshore production. The tree provides for parallel strings of 2⅜-in. OD tubing in a well using six casing strings, ranging from 36 in. to 7 in. in diameter.

Cameron Iron Works is showing its solid block Christmas trees, which feature reduced height and elimination of some connections.

Several manufacturers are exhibiting new approaches to oil well pumping. One is Oilfield Equipment Corp. of Colorado, whose unusual pumping jack provides a compact unit and elimination of the traditional Samson post (picture, above).

Johnston Testers Marketing Division is emphasizing its recently introduced sonic pump for producing low-gravity crudes and fluids containing sand, gyp, or mud. The pump requires only four moving parts on the surface.

A broad range of improved downhole tools and equipment is on display, including a new combination drilling-testing tool. This is the "CR" (continuous retrievable) Sampler of Halliburton Oil Well Cementing Co. that greatly reduces down time. It allows the packer to be run above the bit, so that a formation may be tested at any time, without removing pipe from the hole. This saves the two

round trips necessary to install testing tools and later remove them.

A new hydraulic-set retrievable packer is being shown by Brown Oil Tools for use in deeper production, higher pressures, and heavier muds. The packer is now available in a full line of standard casing sizes for single, double, triple, or quadruple string completions.

An isolation packer is one of the new tools and well services being stressed by Otis Engineering Corp. The design will permit the setting and testing of each packer individually, and is designed to withstand a differential pressure up to 5,000 psi.

Johnston Testers is displaying new downhole tools for drillstem testing, including a new anchoring device for running a selective zone straddle test.

A new acid-resistant oil field wire rope is being shown. Its use for swabbing and cable-tool drilling is being emphasized by Oil Well Supply Div. of U.S. Steel. Called Fibreseal, it has a sisal fibre core impregnated with plastic, which acts as a sealer and prevents absorption of acids and other hole fluids.

BJ Service, Inc., is introducing its new series of tools and equipment, including a 1,200-rpm. triplex ram pump, an 1,100-hp. fracturing unit with new pumps, a new line of aluminum float shoes and collars for running and cementing casing, a cementing unit tested to 15,000 psi., and a retrievable packer with self-aligning slips that automatically center the tool in casing.

Rolling stock innovations include a cementing truck with extra slurry controls. This is being introduced to field service by Halliburton (picture, page 32). The truck is equipped with two pumps, each driven by a 335-hp. Cummins diesel, and each delivering more than 260 hydraulic hp. Controls are remotely located at a centralized point near the 20-bbl. calibrated tank.

Chemical cleaning of storage tanks is made easier with a new jet tool. Exhibited by Dowell, the tool has two nozzles in a revolving jet head (picture, page 33), and is a modification of the company's "Zingger." It sprays chemical solvents at high velocity to remove scale and sludge from internal tank surfaces. It is designed for use in small tanks, in horizontal and cylindrical storage tanks, and in tank cars. The jet head, powered by a hydraulic motor, rotates through 360 degrees, allowing the solvents to contact all surfaces.

The tool is suspended inside the tank through a manhole or placed on the tank floor, and sealed in—thus protecting personnel from solvents or toxic fumes.

Tank-gauging time can be trimmed with a new portable gauger. This is a battery-powered unit being shown by Instruments, Inc. (picture, page 33). The field hand carrying the gauger can measure basic sediment and water content, oil temperature, and tank bottoms without sampling. The gauger has a 16-in. probe attached to a 30-ft. calibrated cable. The probe is lowered into the tank, and temperature and BS&W readings are taken at the top of the clean oil and at several intermediate points to the top of the sludge. When the top of the tank bottoms is reached, an unbalance is shown on the "null indicator." The calibrated cable is read to indicate the bottoms present. The probe is then dropped to the bottom of the tank, and another reading is taken. The first reading is subtracted from the second, to indicate the amount of clean oil in the tank.

The Electr-O-Gauge can be used to gauge a tank in 15 minutes, with only one trip up the ladder necessary—about one-third of the time required for conventional gauging.

New and improved valve lines are among the dozens of other modernized products at Tulsa. For example, a new line of pressure-sealing gate valves is being displayed for the first time by W-K-M Division of ACF Industries. Designed for a wide variety of uses in the oil and gas industries, the valves are in the ASA 150-lb. and 300-lb. class, in a range of sizes from 2 in. to 12 in. The valves need no lubrication.

Producers look for help as . . .

Tight Markets Hit Canadian Oil

Growing production, up substantially from last year, is pressing Canada to develop its crude outlets as never before.

New Canadian Petroleum Assn. figures give a good picture of how production in Western Canada is blossoming this year:

Western Canadian production is now running 8% over 1958, and going higher.

CPA estimates that first-quarter 1959 production reached 47.5-million bbl., up 3.4-million bbl. from the first-quarter of 1958.

Crude potential is now 1.1-million b/d, 100,000 b/d higher than year ago.

The increasing production is coming about despite a falloff in drilling.

Although production is up, completions are off (by 15, to 625); field oilwell successes are down (by 30, to 316); and footage drilled is off (by 400,000 ft., to 3.4-million ft.)

Production is being swelled by the coming of age of giant fields such as Swan Hills in Alberta.

Swan Hills is beginning to look like a billion-barrel area (PW—Apr.24'59, p27). A well drilled by Pan American Petroleum Corp. recently uncovered the field's thickest pay zone to date.

But demand for Canadian crude hasn't kept pace with the increase in productive capacity, and barring major steps by the Canadian government—isn't likely to.

It's true that Canadian markets for crude have been growing. CPA says that Canadian crude demand for the first three months of 1959 reached 39.9-million bbl.; in the first quarter of 1958 domestic demand was only 33.8-billion bbl.

But the difference has been satisfied mostly by foreign crude, which has a competitive advantage over domestic oil in Eastern Canada.

Imports into Quebec and the Maritime provinces topped 28.9-million bbl. during first three months of 1959, up a good bit from the 24-million bbl. imported during the same period in 1958.

This step-up in imports to Montreal refiners has resulted in an increased flow of Montreal product into Ontario. This flow has stunted the growth of demand for Western Canadian crude in the Ontario area, one of the principal markets for such crude.

Ontario refiners nevertheless took 18.8-million bbl. of western Canadian crude during the first quarter, compared with 14.9-million bbl. during the same period a year ago.

It's possible that the latest Borden report—now before Prime Minister John Diefenbaker's cabinet—may recommend that the government add its considerable weight to helping develop markets for the Canadian crude.

As for U.S. outlets on the West Coast, even the recent exemption of Canadian crude from import controls is not expected to make it as economical as crude from the Middle East and Far East.

U.S. Drilling Activity Tops '58

Continued strong demand plus a winter 'backlog' is boosting rig operations. New forecast is for a 10% gain in total footage in 1959.

Domestic drilling activity, which has been in the doldrums for most of the past 18 months, is showing signs of a better-than-seasonal pick-up.

Rotary rig activity in the past few weeks has been hovering close to the 2,100-unit level, after running at an average of no better than 1,900 rigs for the first quarter.

First-quarter rotary activity was just slightly below the first three months of 1958, but completions and footage this year ran about the same as last—12,400 completions, totaling about 52-million ft. of hole.

The recent upswing in drilling activity is attributed to the stronger demand for oil, plus "make-up" drilling that had been delayed by severe winter weather.

The weather in some parts of the Mid-Continent and Rocky Mountain areas was particularly severe during the first months of this year, and it is only now that the backlog of drilling commitments is being worked off, several contractors report.

But other contractors credit the increase in activity to a firm undertone in the economy, one that is now expected to carry through 1959 and into 1960.

Daniel R. Toll, assistant to the president of Helmerich & Payne, Inc., Tulsa, notes that, "The economy is on the rise, and drilling contractors in general are anticipating an upturn in activity.

"Depressed contract prices," he adds, "are beginning to edge up slightly."

The imposition of mandatory import controls so far has had little impact on drilling, but few observers doubt that the restrictions will boost domestic drilling later.

Most major companies plan their drilling programs in advance of a calendar year, subject to bimonthly or quarterly review.

And while smaller producers operate generally "on top" of current situations, few, if any, say they have expanded drilling programs since the imposition of mandatory controls in March.

But several independent operators in the Mid-Continent area report they are now planning to drill on locations that they would not have drilled if mandatory controls had not been ordered by the government.

A spokesman for the Independent Petroleum Assn. of America says most of its members are "expressing their first real optimism in five years." And he adds:

"I believe the psychology of the imports decision will result in a healthy upturn in U.S. drilling."

Several larger producers, including major companies, say that, while import controls have had no effect on their plans to date, they are constantly reviewing budgets.

One Texas producer reports that so far only a lack of prospects has kept him from stepping up activity.

In addition to the imposition of mandatory import restrictions, other factors that may adversely influence drilling abroad, especially in Venezuela, could mean higher U.S. activity.

One adverse factor in Venezuela was the hike in income taxes last year which, observers say, was directly responsible for reduced drilling operations there in the first quarter.

In the first three months of this year, an average of only 99 rigs were operated, compared with 145 in the first three months of 1958.

And it now appears that there will be little pick-up in Venezuelan activity during the year, in view of the U.S. import restrictions and the fact that the results of drilling operations on some of the dry-land concessions have proved disappointing.

Venezuelan oil labor contracts, which have been in effect with the government-controlled union for three years, expire in September. But negotiations for a new labor agreement are scheduled to start in June.

A higher wage rate—if granted—on top of the increased taxes could result in another downturn in Venezuelan activity, with a possibly beneficial effect on U.S. drilling.

The over-all firmer drilling pattern in the U.S. is causing some upward revisions in forecasts, with the possibility that there may be nearly 52,000 completions in 1959.

That's the new estimate of one large integrated company, after a close study of first-quarter activity and of the factors that will influence drilling for the rest of the year.

Such an estimate, which excludes service wells, would represent a 7% gain over 1958.

And, based on the current trends, this company estimates that footage for the year may approach 215-million ft., a 10% gain over 1958, and close to the record drilling footage of 217.9-million ft. in 1956.

Earlier forecasts had shown total completions for the year at about 50,000 holes, with footage slightly above 200-million ft.

Drilling in the Rocky Mountains, despite a slower start than in 1958, is picking up, and estimates now are that activity will top 1958.

The Rockies have been one of the most active areas for the past three years. Last year's completions totaled 4,620 holes, and current estimates are that 1959 completions will hit 4,700.

Drilling in the first quarter in the Rockies ran below last year, but the decline has generally been attributed to the bad weather.

And the backlog of drilling that was piled up in the winter months has been showing up as a sharp rise in new locations during recent weeks.

There has been a noticeable pick-up in drilling activity in California.

Currently, 100 of 210 contract rigs available are operating, compared with only 86 out of 214 a year ago. The highest level reached in any week in the first quarter was 85 rigs.

Drilling activity is perking up in Texas which, until the start of May, was running behind 1958.

Drilling applications through April were about 300 less than in 1958. But now the total for the year has topped the year-ago figure at 7,238.

Rig activity, too, is up. A total of 785 rotary rigs are operating in Texas, 130 more than a year ago and 25 more than a month ago.

Many operators in Texas have been encouraged by the increase in producing schedules this year—now totaling ten "days" over 1958.

Rigs operating in Louisiana, now at 352, are up 20 from a month ago and 64 above a year ago.

Among other major producing states, New Mexico is one of the few where current activity is running below 1958. But the 115 rigs operating in New Mexico are 15 above a month ago. The 248 rigs operating in Oklahoma are 40 more than a year ago. Kansas activity is 8 units above last year, with 140 rigs in operation. In Illinois, 41 units are running, 10 more than last year.

Oil Men Seek Arctic Lease Terms

The initial rush for acreage in the Canadian Arctic Archipelago may be stymied for a while unless current talks between oil men and the government result in more attractive leasing rules.

Judging by the way companies have applied for Arctic oil and gas development permits since the Canadian government began accepting such bids (PW—Feb.27'59,p22), the prospect of exploring in the Arctic would seem to be quite attractive to oil and gas men.

But nearly all of these applications were received before basic leasing conditions were made clear. Northern Affairs Minister Alvin Hamilton, who is administering the Arctic leasing, announced his department's general leasing policies late last month.

Almost to a man, prospective lessees oppose the set of rules.

So Hamilton is having members of his staff meet with representatives of the Canadian Petroleum Assn. to see if the program can be made more favorable to the industry.

Canadian oil men say that the Arctic leasing provisions are simply not attractive, and that they will delay development of the vast area.

At stake are some 250,000 sq. mi. of mainland north of 60 degrees latitude, and the Canadian Arctic islands. The area of the Arctic Continental Shelf may some day add another 100,000 sq. mi. to the area to be developed.

But there will be little development as long as the current leasing conditions remain, Canadian operators insist.

The oil men's biggest gripe is that the leasing rules do not take into consideration the "special problems posed by the Arctic."

While the rules would be perfectly satisfactory in more accessible areas, they say, they simply do not offer enough incentive for the Arctic, where the risks are so much greater.

Hamilton has announced that, "The Crown may grant leases . . . in any way it sees fit." He set forth these possible leasing procedures:

"Lease the rights to the highest bidder; or lease the rights to the person bidding to pay the highest gross royalty on production from the area . . .; or set a high basic royalty, say 50% royalty, and accept the tender of the highest cash bidder based on this royalty; or have regard of the financial responsibility and financial structure of the bidding companies and take into account the extent to which Canadian capital will have an opportunity in participating."

Oil-industry opposition to this condition couldn't be much stronger.

One oil man told PETROLEUM WEEK: "Sure—let the fellow who backs down when production begins to slow have the first whack at taking the cream off the wells."

Another asked: "Due to one factor or another, what good would it do a small producer to bring in a producer?"

And another summed it up this way: "It's damned expensive to operate up there. We haven't really licked the muskeg yet. That territory is different from anything that exists anywhere.

"And we've got to find some regulations to suit it."

Oil men are also bitterly disappointed with the government's adoption of the Crown Reserve system, by which 50% of the permit area—and this 50% spread in a "checkerboard" pattern—returns to the government.

Under this system, an exploration permit is given to an operator on the condition that at least half of the land in the permit reverts to the Crown.

"This 50%," says Hamilton, "is in such a pattern that the Crown will likely hold land over any possible oil and gas pools."

One operator puts his reaction to this leasing condition quite succinctly: "If that's the way it's going to be, you can kiss goodbye to exploration. No company is going to take the big risks unless it stands a chance to reap the kind of profit that would reflect the risk involved."

Several other Canadian operators say that a checkerboard pattern would make the oil so uneconomic that it could not meet competition in the North American picture right now, or competition in the world picture "down the road."

Finally, the government wants a "complete return of exploration information to the Crown." This, operators refuse to do.

Hamilton has suggested that companies make public all geological and geophysical information one year after they abandon a test site.

But operators say that Hamilton's idea is contrary to established practice, and that they just won't buy it.

"Exploration is a very competitive business," one operator points out. "Companies take pride in their methods. Each has a different method of shooting, and that's its trade secret in a very competitive field."

The political flavor of the recent statement announcing the Arctic leasing requirements has many operators believing that changes in the requirements will come hard.

Hamilton set up his leasing conditions with this statement:

"The apathy of the previous [Liberal] administration, which failed completely to develop a policy for protection of the public interest in the oil and gas resources in northern Canada, will rank as one of the greatest examples of economic ignorance and failure to protect the public interest the world has ever experienced."

To which one Canadian independent had this reaction: "I started to read the policy statement, but there seemed to be so much politics in it that I discounted it completely for that reason."

Oil's Safety Record Shows Slight Gain

The oil industry's safety record which has been steadily improving over the past several years, continued to show slight gains in 1958, the American Petroleum Institute reported this week.

Statistics for the API's annual safety study were compiled from the records of 255 oil companies and their subsidiaries, representing 522,218 employees and more than a billion man-hours of work during 1958.

Although the frequency of injuries improved by only a negligible percentage last year, it's down a whopping 78% over the last three decades.

The 1958 rate was 7.00 injuries per million man-hours worked. This compares with 7.05 in 1957, 14.43 in 1945, and 31.15 in 1927.

The number of days lost because of injuries per million man-hours worked (the so-called severity rate) dropped to 704 in 1958 from 712 the year before.

Drilling—traditionally the most hazardous branch of the industry—showed a sharp improvement last year.

The frequency rate dropped 7.2%, from 30.95 to 28.73. And the severity rate was down from 4,642 to 3,010—a whopping 35.2% improvement.

Refining, on the other hand, showed an increase in frequency from 4.71 to 5.00, although its severity rate was down from 689 to 656.

HAMONDFLOTE* plastic COVER CRASHES CONSERVATION BARRIER

For over one year Sohio has tested a HAMONDFLOTE COVER installation at their Andover, Ohio bulk station. Tests involved mechanical operation, general performance and conservation characteristics.

Based on the results of tests SOHIO HAS PURCHASED SIXTEEN ADDITIONAL HAMONDFLOTE COVERS for their field conservation program.

. . . And here's what the man in charge of Sohio's station says:

"In reply to your letter of January 12, I have a HAMONDFLOTE COVER in an upright gasoline tank containing two four inch inside circumferential angles. The COVER is working excellently. It floats up and down over the angles with no ill effects on the COVER. I cannot see that there has been any wear on the COVER in a years use. It is a 25,000 gallon tank and I sell 10,000 gallons a week so it has had constant use.

The savings were apparent a week after it was installed as no fumes could be detected by nose through the top manhole cover.

It has not caused any trouble as far as filling or measuring the product or overall depth of tank (as for water or contamination of product) since it was installed. I would highly recommend the HAMONDFLOTE COVER for all products, especially gasolines."

Robert Runyan,

The Hamondflote Cover is the first practical, economical and guaranteed floating roof for small diameter tanks in marketing, bulk storage, producing and processing operations . . . constructed of rigid Polyisocyanate foam—a plastic material with exceptionally low density and high load carrying capacity, chemically inert to hydrocarbons. The Hamondflote Cover: Pays for itself in several months • Prevents product evaporation • Conserves vapor • Preserves product • Reduces corrosion of storage tanks • Low cost—no maintenance • Unsinkable • Virtually indestructible • Long life *(more than 10 years expectancy)* • Unaffected by working temperatures *(from —94° to + 300° F* • Easily installed or removed

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More Changes Coming for Import Plan

The government, it now appears, will eventually modify the mandatory import restrictions in several directions to alleviate hardships.

The modifications will take the form of (1) exemptions for individual companies that cannot comply with the provisions that require crude and unfinished oil importers to own refinery capacity, and (2) basic changes in the rules.

The first basic change was the exemption of Canadian and Mexican imports delivered by overland transportation.

That was a basic change in policy to appease Canadian demands that the U.S. restrictions unduly penalized Canadian producers by preventing them from seeking their "natural" market outlets in the U.S. Upper Midwest and the Puget Sound area.

Also, the Oil Import Administration has indicated that it may broaden the base period for determining allocations of residual fuel oil and other finished products (PW—May8'59,p16).

Import Administrator Matthew V. Carson, Jr., has sent forms to companies that imported during all or part of 1958, in order to develop data for the next allocation period. At present, product quotas are limited to companies that imported in 1957.

The next change that may be made, effective July 1, will be to "liberalize" the restrictions on unfinished oil imports to the West Coast.

That has been requested before the Oil Import Appeals Board by several companies. They've argued that the limitation of unfinished oils to 10% of the total crude and unfinished allocation, which is in effect in all refinery districts, poses a hardship on West Coast (District V) refiners because of the shortage of light crude in California.

It is now expected that changes to permit "more flexibility" will be announced in the District V limitation on unfinished oils by May 25, when the OIA hopes to release allocations for the July-December period.

The change may be made by keeping the 10% limit on an over-all West Coast basis, but granting "unused" unfinished imports to companies requesting a higher allocation.

About the only advantage such a modification would offer is that it could be applied administratively, within the scope of the proclamation establishing rules for OIA.

But, observers warn, it would not solve the supply problem in California, which is, essentially, that too much low-gravity crude results in a yield of too much residual fuel.

Some companies, such as U.S. Oil & Refining Co., would like their entire allocations in unfinished oils. U.S. Oil has obtained a court order permitting it to import 6,000 b/d of unfinished oils.

The change could also be made by increasing the unfinished oil percentage on the West Coast, but that would require a new Presidential order.

Government officials have discussed the possibility of vesting in the Secretary of the Interior broad discretionary powers to change the ratio of unfinished oils to crude in District V.

A figure of 12% to 15% of unfinished oils has been mentioned.

One U.S. Senator has petitioned the government for complete elimination of the 10% limitation.

Senator Thomas Kuchel (R., Calif.) urged the elimination in a letter to Interior Secretary Fred Seaton.

He advised Seaton that he had received "many complaints from small independent oil producers that this provision has produced an unforeseen inequity."

Carson, replying for Seaton, questioned the complaints from producers. He wrote Kuchel:

"Inasmuch as each barrel of imported unfinished oil, particularly naphtha, can compete more favorably with California crude than imported crude can compete with California crude, I am at a loss to understand why an increase in permissible unfinished oil imports can have the beneficial effect on California production claimed by some crude producers."

Carson, while not spelling out possible courses of action in his letter, did advise the senator:

"We are contemplating taking steps to allow more flexibility in the limitations on permissible levels of unfinished oil imports into District V."

Another basic change in mandatory controls that appears possible later is the exemption of imported finished asphalt and asphaltic crudes.

OIA hasn't indicated that such a change is being considered, but there is mounting evidence that it may become necessary.

Long before the present mandatory plan was ordered, many companies had asked that asphaltic crudes receive some exemptions from over-all allocations.

Since the plan became effective, one company—Texas American Asphalt Co.—has been granted a temporary restraining order permitting it to import Venezuelan crude for its Lacoste (Tex.) plant. A hearing has been put off until May 29.

Last week Standard Oil Co. of California went before the appeals board seeking more asphaltic crude for an East Coast affiliate on the ground that it could not line up sufficient supply in the U.S.

The company testified that of 25 domestic producers contacted, only three companies offered it finished asphalt and four offered it asphaltic crude.

Socal said its most "liberal" specification was for crude with a minimum 50% yield of asphalt, and the best offer was crude with a 40% asphalt content.

Puerto Rico Plant Suit Filed

Commonwealth Oil Refining Co. has filed a $60-million damage suit in federal district court at San Juan, P. R., against The Lummus Co. in connection with construction of Commonwealth's twin refineries.

The suit alleges that Lummus supplied "misleading and erroneous studies causing the plaintiff severest financial loss."

Lummus designed and built the twin plants, which are located on Puerto Rico's south coast, near Ponce.

James F. Thornton, president of Lummus, says Commonwealth's claims are "unfounded," and that his company "categorically denies the charges."

The two companies entered into construction contracts in 1953 and 1955. Lummus claims work on both contracts has been completed, and that Commonwealth owes it $4.7-million.

Commonwealth said in its annual report that it had not accepted either plant from Lummus.

The contracts reportedly call for arbitration of unsettled differences, and a motion to stay arbitration proceedings will be heard in the San Juan district court May 29. In addition, Commonwealth has asked the court to declare the $4.7-million balance-due claim invalid.

PRODUCTS FOR THE OIL INDUSTRY

"From spud to pay I rig up with...

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U.S. RUBBER PRODUCTS"

says toolpusher "Red" Royal

Hard-driving, hard-working "Red" picks "U. S." products to put muscles on his rig. He knows from experience that "U. S." products are the *best* insurance against downtime he has ever found. They are designed and made by men who know all about oil field problems—men who are out to help the driller get more and more footage—in less and less time—at less cost.

"I use it all the way from spud to pay—no switching of hose!" says "Red" Royal about U. S. ROYAL 4 ROTARY HOSE.

"In Texas, just one U. S. Royal 4 drilled over 300,000 feet in over 3 years, at a hose cost of less than a penny a foot drilled!" No need to keep money tied up in stand-by hose to finish wells. U. S. Royal 4 handles the highest pressures . . . no downtime in order to switch. No lubrication needed; complete flexibility from nipple to nipple.

"I insist on belts that have proven they wear longer. That's why I always see to it that U. S. Royal V-BELTS are on my rigs."

Take for instance, this performance record: On a compound drive U. S. Royal V-Belts drilled over 218,970 feet of hole, moving from location to location. At last count, they were still on the job after 43 months. The contractor says the belts he had previously used failed after three wells. New cords, new fabrics and new construction have increased the H.P. rating of U. S. Royal by 40%. Yet, with all this, you pay no premium for the new U. S. Royal V-Belts.

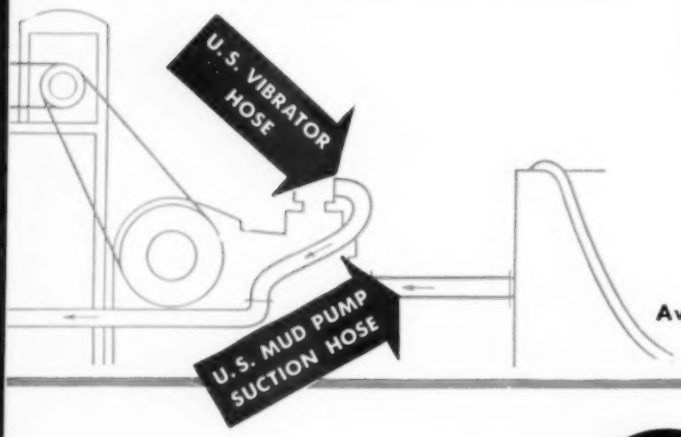
"Withstands the highest pressures met in today's drilling operations." U. S. MUD PUMP VIBRATOR HOSE P-8087.

Standard equipment between mud pump and standpipe. Does away with broken pipe and loose connections. Takes up misalignments between mud pump and mud line. Speeds rig-up time.

"The hose that can't collapse!" U. S. GIANT® HEAVY-DUTY MUD PUMP SUCTION HOSE P-8048.

High flexibility permits quick adjustment of the intake of the line to the right position in the slush pit without changing connections. This hose keeps air out of the line, thus reduces wear on valves and pistons, and often saves 2 or more connections in each line. Will not collapse, thanks to heavy spring-steel coil construction. Handles chemically treated or oil-base mud, or crude oil.

"Red" Royal also relies on plenty of other "U. S." products. "I use other types of 'U. S.' oil field hose," says "Red," "plus 'U. S.' packings and U. S. Royal V-Belts. I always get the best out of my rigs, and 'U. S.' helps me do it."



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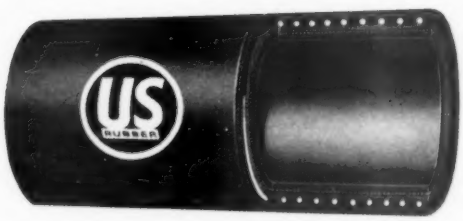
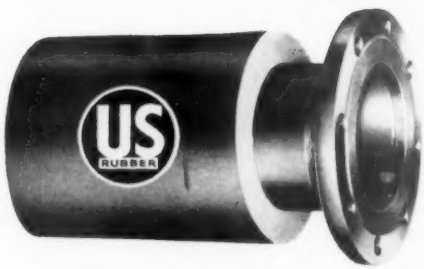
U.S. MATCHLESS® CABLE-LAY ROTARY HOSE—STYLE P-7122 For use wherever API standard Grade C hose (5000 lb. test) is required. Recommended for use in deep wells under average drilling conditions. Made with 19 strands of high-tensile steel, stranded so as to eliminate the twisting of cable wire when stressed. Made of neoprene to provide top resistance to damage from oil-base mud.

U.S. PEERLESS® ROTARY HOSE—STYLE P-8017 For use wherever API standard Grade A hose is required. Suitable for small rigs at medium or low pressures. Excellent for clean-out rigs. High hydrostatic value. Tube of neoprene provides maximum resistance to oil-base mud. Neoprene cover resists sunlight, oil, abrasion.



U.S. GIANT MUD PUMP SUCTION—STYLE P-8048 For handling chemically treated or oil-base mud, or crude oil. Flexible construction permits quick adjustment of the intake of the line to the desired position on a slush pit without changing connections. Heavy spring-steel coil construction makes collapse of hose impossible.

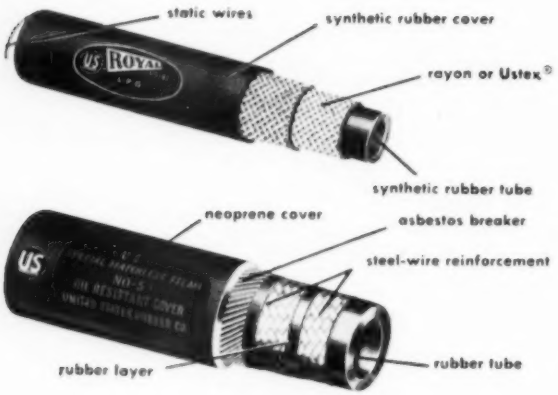


U.S. ROYAL MUD-RETURN LINE—STYLE H-2000 Used as a mud-return line from the drilling platform to the drilling tender. Strong, yet lightweight and flexible. Use of neoprene inside and out gives high resistance to oil, abrasion and sunlight.

U.S. MUD PUMP VIBRATOR HOSE—STYLE P-8087 For a flexible hook-up between the mud pump and the standpipe. Will handle the highest pressures. Saves rig-up time over connections made with steel pipe; flexibility eliminates vibration and does away with broken pipe and loose connections; takes up misalignments between mud pump and mud line, making close alignment unnecessary. Neoprene tube and cover are resistant to oil-base mud, abrasion and sunlight.

U.S. FLEXLITE® FIRE HOSE—STYLE P-1180D This high-pressure, lightweight hose is specially designed for fire protection in petroleum and chemical plants. Lighter than ordinary double-jacket 400-lb. cotton fire hose—to permit faster laying time. High flexibility permits easy coiling and racking. Three-ply laminated tube resists damage by oils or chemicals. Both warp and fill yarns in jacket made of high-strength Dacron*, which is impervious to action of mildew. Coating of neoprene cement for extra resistance to oils and chemicals.

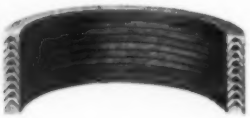
*Du Pont's polyester fiber



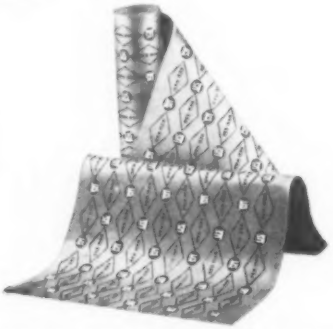
U. S. ROYAL LPG HOSE—STYLE P-5141 For fuel-line connections for use on auxiliary equipment. Strong, flexible. Both tube and cover of specially compounded synthetic stock resist permeating action of liquid petroleum gas. This hose surpasses all existing State safety regulations.

U. S. MATCHLESS STEAM HOSE NO. 5—STYLE P-409 Very flexible. Neoprene cover resists action of heat, oil, weather. This hose never bursts—after long service, need for replacement is indicated by slow "bleeding" of hose.

PACKINGS

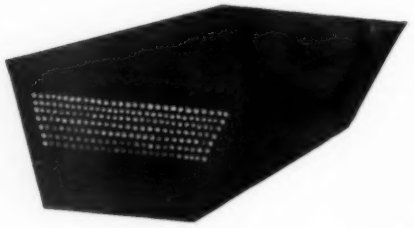


U. S. MATCHLESS V-TYPE PACKINGS—duck and rubber, Style 16010; duck and neoprene, Style 16012; duck and Buna-N, Style 16070. For hydraulic service on pistons or pumps handling hot or cold oils, brine, ammonia, gases. High-quality duck (or asbestos) fabric. All rings molded with blunt edges to produce better pressure distribution and prevent scoring by trapping dirt and scale. Lubricants in grooves reduce friction wear.



U. S. REDMAN® SHEET PACKING—STYLE NO. 49 Redman sheet packing is designed by "U. S.", the *original* maker of red sheet packings. Style No. 49 is for service against hot and cold water, saturated steam pressures up to 125 pounds, and general hydraulic conditions. First on the market, and always first in performance among red rubber sheets. Standard rolls 36" wide, weighing about 100 pounds, in thicknesses of 1/32", 1/16", 1/8", 3/16", 1/4".

U. S. ROYAL V-BELTS



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U. S. SECURITY® FRICTION TAPE—for all taping and splicing jobs. High physical strength and resistance to tearing. Good surface tack and consistently permanent adhesion. No pinholes. Long storage life.

U. S. HOLDTITE® TAPE—exceeds ASTM standards. For just about all jobs, and for most high-voltage splicing.

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for extra resistance to oils and chemicals.

*DuPont's polyester fiber

What's New / IN THE INDUSTRY

Alaska plans to offer an estimated 3-million acres for offshore oil and gas drilling within 90 days. The state expects to advertise for bids on offshore tracts early in July and grant leases during August, thus allowing preliminary exploration by September. Leases will be offered in Cook Inlet, southwest of Anchorage, and on Wide Bay, west of Kodiak. Under the new state land act, a lessee may hold a maximum of 500,000 acres offshore and 500,000 acres of uplands.

•

The Teamsters Union's attempt to gain a foothold at Esso Standard's Baton Rouge plant has been knocked out for the present. Members of the Independent Industrial Workers Assn. voted almost three to one to accept a new contract, thus retaining its representation. The contract, cannot be signed, however, until a Metal Trades Council's petition to the National Labor Relation Board for a representation election is withdrawn, or the election held.

•

Colorado producers can no longer deduct oil and gas production taxes in paying the state's gross income tax. Governor Steve McNichols signed a bill last week which requires oil and gas producers to pay both taxes without taking credit for either in computing the other.

•

Business recovery will continue, but unemployment will rise, according to Clarence R. Jung, an economist for Indiana Standard. He predicted that recovery from last year's recession will continue into 1960 and will be boosted by larger investments in plant and equipment. This, in turn, will increase unemployment because new equipment "is making it possible to do more with fewer workers," he said.

•

An all-butyl rubber automobile tire went on the market this week. The tire, being marketed by Esso Standard Oil Co., is said to offer smoother riding, increased safety, and greater resistance to cracking and deterioration than conventional tires. The synthetic rubber was developed originally for inner tubes because of its good air-holding qualities.

•

Microballons, developed to prevent evaporation of crude in storage tanks, are now being used as insulation in clothing. Millions of the microscopic spheres developed by Standard Oil Co. (Ohio) are held permanently in each yard of fabric by a coating compound, in coats, rainwear, and suits.

•

A final settlement of the long dispute over the price of gas in Oklahoma's Ringwood field has been put off at least until June 26. While 95% of the producers reached a price agreement with Oklahoma Natural Gas Co. and Warren Petroleum Corp. last month, calling for 6¢ per Mcf. on gas and 40% of value of liquids processed, starting next March, the Corporation Commission decided this week to continue several applications opposing a commission production order for the field.

•

George V. Myers, production vice-president of Standard Oil Co. (Ind.), has been named executive vice-president, filling a post vacant for two years. The other executive vice-president is Robert C. Gunness.

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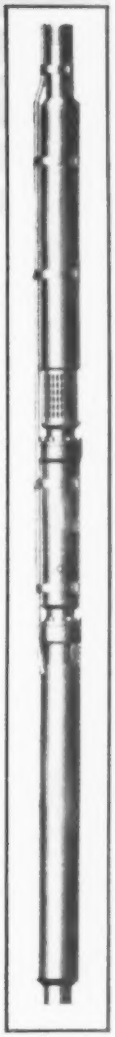

High capacity Reda Pumps produce fluid volumes up to 18,000 barrels per day from standard size casings. You can profitably produce wells with a high water-oil ratio. Investment cost per barrel of daily capacity is far lower when you choose REDA for high water-oil ratio wells.

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Looking Ahead in Washington

McGraw-Hill
Washington
Bureau
May 15, 1959

Take a midsession look at legislation and investigations in the 86th Congress. After the 1958 elections, this Congress was expected to drift to the left under a heavy Democratic majority. Instead, Congress has remained moderate—adopting a tone best exemplified by the bloc of Western-State senators. The major anti-business—and anti-oil-industry—measures that were threatened seem to be going by the board.

•

The biggest oil battles predicted for Congress—imports and depletion—are fading. When the Administration placed oil imports under mandatory controls, Sen. Joseph C. O'Mahoney (D., Wyo.) said specific legislative authority was needed. But so far O'Mahoney has held no hearings, and may not.

Depletion probably still will get a test vote in the Senate, however. Sen. William Proxmire (D., Wis.) is still waiting for a tax bill, to which he will attempt to attach a depletion-cutting rider. Proxmire has no hope that the depletion rate will be cut, but he would like a show of force which might set the stage for 1960 or later. But Chairman Wilbur Mills (D., Ark.) of the House Ways & Means Committee hasn't changed his mind—he doesn't want any major tax legislation this year. Depletion still will be involved in hearings planned by Mills for later in the year.

Democratic leaders are still opposed to president Eisenhower's plan for a gasoline tax increase. Eisenhower envoys in Congress still hold hopes for a boost of 1½¢ a gal., but the Democrats say other methods for financing the highway program should be adopted. And the Democrats speak loudest on this matter.

•

S-11, the competition bill, now is pending before the Senate Judiciary Committee. The subcommittee headed by Sen. Estes Kefauver (D., Tenn.), the bill's chief sponsor, reported the bill last week. In past years, S-11 has been stopped in its tracks by the full Judiciary Committee, or reported too late for Senate consideration. And the committee has a new rule which would enable members to delay a subcommittee report for an additional two-week period. Late in a session of Congress, timing becomes all-important.

Premerger notification still has a chance of passage. This proposal, also pending before the Senate Judiciary Committee, would require 60-day advance notice to the government before mergers involving more than $20-million in total corporate assets could be accomplished.

But price notification legislation isn't expected to get anywhere. Sen. O'Mahoney's bill would require 30-day advance notice to the Federal Trade Commission and the Attorney General before major companies—such as oil firms—could raise prices. But the Justice Dept. and FTC oppose the bill, and it has little chance of passage.

•

Congress will extend the authorization of the Interstate Oil Compact Commission. Legislative consent is required for such interstate bodies to operate. The House Interstate Commerce Committee is ready to report a bill authorizing a four-year continuance of the compact. The measure is expected to clear the House and Senate without any snags.

1859 – the famous Drake discovery at Titusville, Pa., signaled the birth of the oil industry in the United States. From this pioneering site grew one of America's mighty industries whose operations extend into Canada and around the world.

When These Shingles Went Up....

A Century of U.S.-Canadian Cooperation Was Born

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Mission MUD MONARCH® Valves and Seats *for extremely high and medium pump pressures.* Unique design with exclusive seal ring results in exceptional performance as this ring seals effectively when body and seats are severely worn. Compound 308® and Compound 711 inserts are available.

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YOU'RE INVITED TO SEE OUR NEW PLANT IN HOUSTON

Arizona Exploration At Highest Level

Shell Oil Co.'s completion of an extension to East Boundary Butte field in northeastern Arizona may serve as a spring tonic to the increasing number of oil and gas hunters in that state.

Shell's No. 23-11, section 11-41n-28e, Apache County, was completed last week for 96 b/d of 44-gravity oil and 640,000 cf/d of gas through 20/64-in. choke and perforations at 4,460-510 ft. in the Upper Hermosa (Pennsylvanian).

The second day's production was 104 b/d of oil and 775,000 cf/d of gas through the same choke. Tubing pressure was 940 psi., and casing pressure was 1,100 psi.

The well is a little more than ½ mi. east and slightly south of what is considered the state's first commercial producer—Humble Oil & Refining Co.'s No. 1-E Navajo, 1 mi. southeast of East Boundary Butte gas field. The Humble discovery was completed last October for 562 b/d through 5/16-in. choke and perforations in the Hermosa at 4,594-644 ft. and 4,726-72 ft. (PW—Oct.3'58,p28).

East Boundary Butte is 2 mi. north of Toh-Ah-Tin gas field and 15 mi. west of Bita Peak gas field, the only other fields in Arizona. The latter two fields, both of which produce from the Paradox, were discovered only a few days apart in August, 1956. All of the gas wells in the three fields are now shut in.

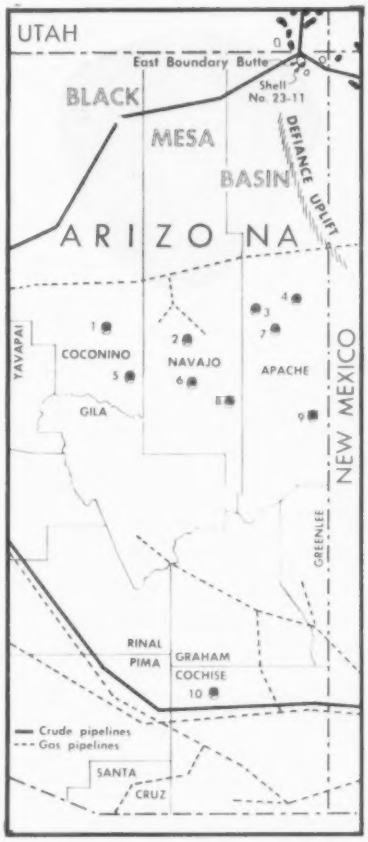
The present tempo of activity assures a record year of drilling for Arizona.

Eight tests are being drilled, two are ready to be spudded, and at least seven more are scheduled. And in addition to the Shell completion, six other holes have already been drilled this year.

This total compares with 18 operations in the state last year, of which 16 were wildcats. The only producer resulting from this effort was Humble's No. 1-E Navajo.

The 1958 total compares with only five holes drilled in 1957, three of which were completed as helium gas producers by Kerr-McGee Oil Industries, Inc., in Apache County, on the southeast flank of the Black Mesa Basin. Another five holes were drilled in 1956, resulting in the discoveries of Bita Peak and Toh-Ah-Tin. Drilling was sparse in prior years.

Though the only oil or natural gas production found to date is limited to the northeast corner of the state, current exploratory activity is centered in the east-central portion.



SHELL'S COMPLETION gives Arizona its second oil well, both in the East Boundary Butte area. But bulk of current drilling is much farther south, as shown.

Seven tests are now being drilled in the south ends of Apache, Navajo, and Coconino Counties. Two others are scheduled.

Many of these tests are in the helium gas area, where Kerr-McGee has seven shut-in wells.

Here is a rundown on tests in Apache County:

• Texas American Oil Corp. No. 1 Fitzgerald, section 22-20n-25e (No. 3 on map), has had surface casing set. Projected depth is 3,500 ft. This test is 4 mi. west of Kerr-McGee's shut-in wells on Pinta Dome.

• Mae Belcher, Trustee, No. 1 State, section 20-9n-31e (No. 9 on map), drilling below 2,735 ft. toward a projected 4,500-ft. Devonian target. Helium shows were reported at 780 ft., and natural gas in untested amounts below 2,700 ft.

• James G. Brown & Associates No. 2 Chambers-Saunders, section 27-21n-28e (No. 4 on map), drilling below 900 ft. Helium shows have been reported.

• Wilkinson Oil & Gas Co. will drill the first of three tests in section 28-19n-26e, in the Pinta anticline area (No. 7 on map). These will be rotary and air-drilled, the first such in the area.

Two tests are drilling, and one other is ready for spudding, in Navajo County. They are:

• Tucson Oil & Gas Production Corp. No. 1 Woodman, section 30-18n-20e, in the Penzance Dome area (No. 2 on map), fishing at 300 ft., at last report.

• Lydia Johnson No. 1 Aztec Land & Cattle Co., section 33-14n-20e, in the Snowflake anticline area (No. 6 on map), drilling below 2,680 ft. toward a projected depth of 5,000 ft.

• Pan American Petroleum Co. and El Paso Natural Gas Co. No. 1 Fee, section 25-12n-23e, in the East Taylor anticline area (No. 8 on map), to be drilled with rotary. This is the first of four proposed tests to be drilled by this team in this area.

Two tests are under way in Coconino County:

• Lion Oil Co. Division of Monsanto Chemical Co. No. 1 Cabin Wash Federal, section 30-14n-14e (No. 5 on map), has been spudded. This test, in Sitgreaves National Forest, is projected to 3,500 ft.

• Western Oil & Minerals, Inc., No. 1 Walters, section 24-19n-10e, on the Anderson Point anticline (No. 1 on map), drilling below 100 ft. toward programmed 4,600 ft.

One wildcat is being drilled in Cochise County, in the southeastern corner of the state.

Floyd Duncan et al No. 3 State, section 33-13s-22e (No. 10 on map), was drilling below 620 ft. at latest report. This group has drilled two previous tests in the same general area in the past three years, all dry holes. Other failures have also been drilled there.

There are reports that several tests are planned in Mohave County, in the northwest corner of the state.

Sun Oil Co. is reported planning a series of tests in the "strip country" in the north end of this county, scene

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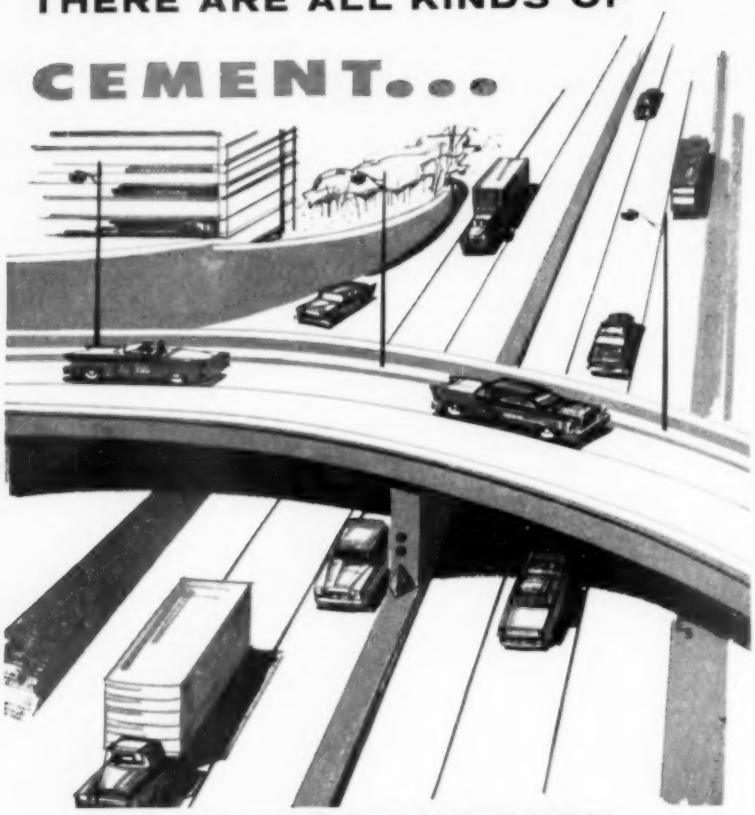

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of one dry hole last year. The Sun series will be drilled on farmouts of acreage that once was included in a Naval oil reserve.

Valen Oil & Minerals Corp. also has announced plans for a series of wildcat tests in the north end of Mohave County.

Shell's new oil well will be watched closely as a possible indicator of real oil development in the East Boundary Butte area.

East Boundary Butte was opened as a Hermosa gas field by Shell in December, 1954. The field is located on the Boundary Butte anticline, a prominent surface feature that extends into Utah. It is on the north flank of the Black Mesa Basin and the south edge of the productive Paradox Basin.

Reported production in 1955 from three wells in this field—now shut in—was 122-million cu. ft. of gas and 750 bbl. of condensate.

Shell intends to keep its oil completion under close study for a time before committing itself to further development.

A workover is now in progress on Humble's No. 1-E Navajo oil well. This well has been shut in since Jan. 13, and Humble isn't sure yet when the present work will be completed.

Humble is not working on any other operations in the area, and has made no announcement of further drilling.

Propose New Safety Rules for Offshore

Several new safety rules have been recommended for offshore drilling as a result of the fire that swept a CATC group platform last fall.

A Coast Guard investigation has been unable to determine the exact cause of the fire that destroyed platform 45E off the Louisiana Gulf Coast (PW—Dec.5'58,p27).

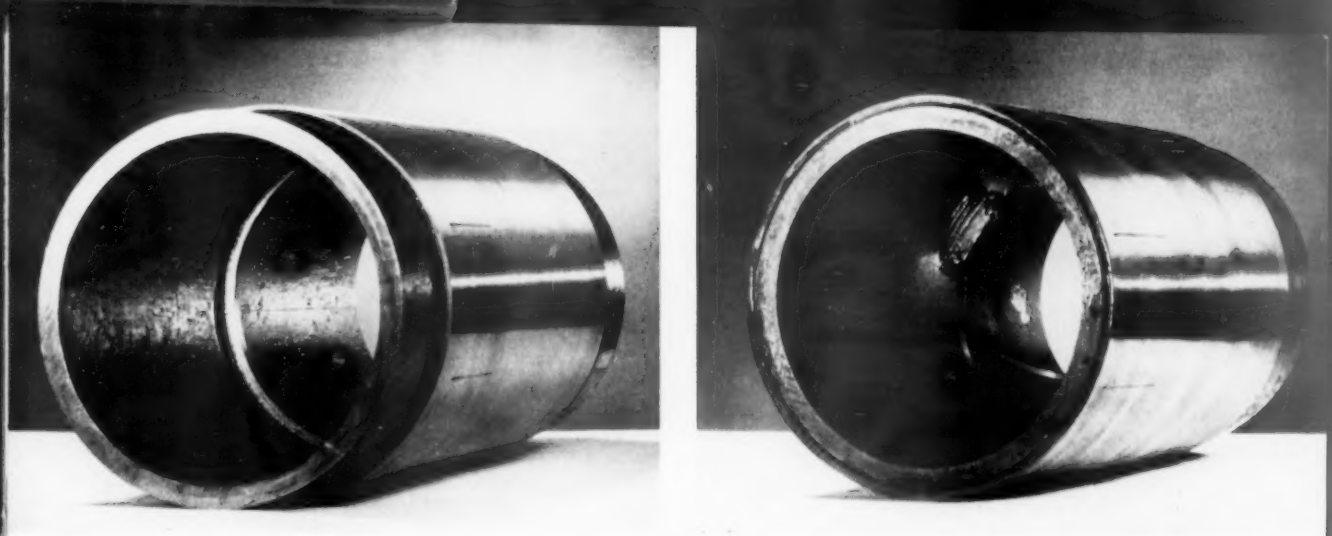
The Coast Guard does say, however, that a 30-in. casing was being welded on the main deck when the fire broke out.

The Marine Casualty Board says that, while the exact cause cannot be determined, a large volume of gas and oil was released from one of the wells' manifolds or piping under pressure.

The proposed rules specifically restrict welding on platforms, in addition to a general tightening of safety procedures.

Ignition for the fire, the board says, was provided by the flux from the welding, which was being performed on the main deck.

As a result, the board recommends:



A National Super Deep-Well Coupling, containing two sections of 7¾" O.D. Deep-Well Casing with Buttress-Thread. Each section projects 2" from coupling.

BEFORE

AFTER

The power hammer has driven one section of the casing into the coupling to meet with the other section. Both sections are a mass of distorted and twisted steel, yet the casing coupling did not fail.

How tough can a casing joint get?

USS National Buttress-Thread joint takes brutal pounding but remains intact!

Six times a 4000-pound steam hammer, under terrific velocity, slammed down onto the USS National Deep-Well Casing driving it into the Super-Deep-Well Coupling. Inside the coupling, the threads played leapfrog—the two sections of casing met in the middle of the coupling, and climbed all over each other. With each smashing blow, the coupling "bellied" out until it began to look like a buckled barrel. But it remained intact.

How tough can deep-well drilling get?

This test is a simulated drop test, designed to approximate, as closely as possible, severe field conditions. Although the test is more severe than any shock load a string of casing might encounter in the hole, it does prove conclusively that the Buttress-threaded and coupled joint is more than ready to withstand the tough deep-well stresses.

In addition to this drop test, many hydrostatic and galling tests have been made at the mill on the Buttress-Thread joint, with highly successful results. The high tensile strength of the patented Buttress-Thread joint is due largely to the combined effect of the completely engaged runout threads and the three-degree flank angle of the thread which supports the weight of the casing in the well. The joint is virtually as strong as the body of the pipe.

For further information on National Seamless Threaded and Coupled Casing, or these other National Seamless Oil Country Products —Deoxidized Bessemer Steel Casing and Tubing, Warm-Worked Casing, Threaded and Coupled Drill Pipe, *Deep-Well* Casing, *Super Deep-Well* Casing, and Hi-Pres-Sure External-Upset Tubing—write to National Tube Division, United States Steel Corporation, 525 William Penn Place, Pittsburgh 30, Pa. Export Distributors: United States Steel Export Company, New York.

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• Welding and burning on offshore platforms be prohibited except when all wells are shut in.

• Emergency fire drills be held once each month for each regular crew that is working in such offshore structures.

• Owners be requested to designate one person with responsibility for enforcing safety regulations.

• Consideration be given to legislation to authorize administrative penalties for noncompliance with safety regulations.

The Coast Guard commandant, however, maintains that present enforcement procedures are adequate.

Howco Offers Manual on Fracing

A simplified approach to complex oil-well fracturing problems is being offered to oil men by Halliburton Oil Well Cementing Co.

At a recent customer meeting in Wichita Falls, Tex., the service company passed out, for the first time, copies of its new technical publication, "A Method for Fracturing Treatment Design."

The manual employs charts, curves, and formulas which enable the oil man to pick for himself the treatment best suited to his particular oil well.

W. E. Hassebroek, technical supervisor of fracturing services for Halliburton at its Duncan (Okla.) headquarters, told PETROLEUM WEEK: "We believe that if the oil man can get from us a coefficient for the fluid he has in mind, he can go on from there and successfully evaluate the job he wants.

"We have found that many of our customers often like to work things out for themselves, and this new publication gives them something definite to go on."

Halliburton will continue to make available to its customers all previous engineering services, and to work closely with oil company engineers in designing the most suitable treatments for their wells.

The new method is based on both experience and theory.

Specific well data required includes effective permeability, core analysis, porosity, bottomhole temperature and pressure, viscosity of fluid, gas-oil ratio, and water production. In most cases, this information is available from reliable sources, such as drillstem tests, electric logs, and laboratory analysis.

All available information is "fed into" and worked through the publication to obtain the best possible treatment for the money to be expended. Several alternative treatments sometimes evolve.

The method works by correlation of all known reservoir data, past fracturing history, and the desired production figure. This information, when applied to the appropriate curves and formulas contained in the publication, gives the operator a reliable estimate of the frac fluid, treating pressures, injection rates, and sand volumes that will do the best job in his well.

Treatments calculated by Howco's new fracture planning method often indicate the need for a more efficient fluid, or possibly a greater volume of propping agent. Proper packing of the fracture, for example, tends to prevent healing, gives better flow capacity, and minimizes sand return. Better sustained production is the result.

In connection with its fracturing manual, Halliburton has been engaged in an intensive program of evaluating many types of domestic oils.

Since fluid properties are important considerations in oil-well fracturing, Halliburton has carried on this work at many of its field laboratories.

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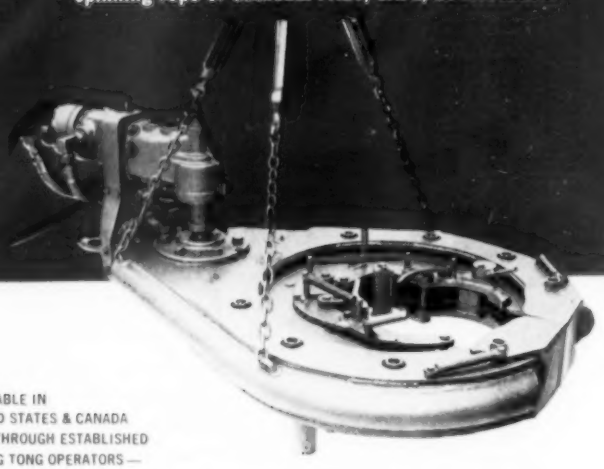

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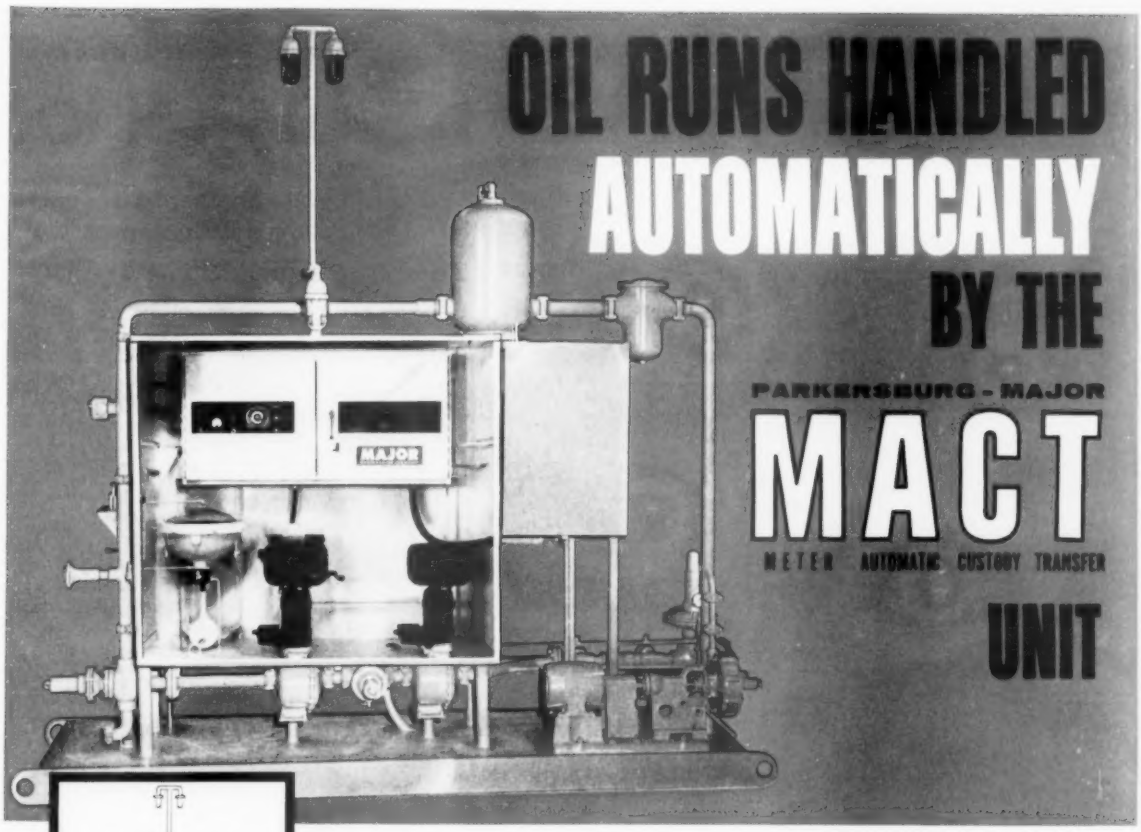

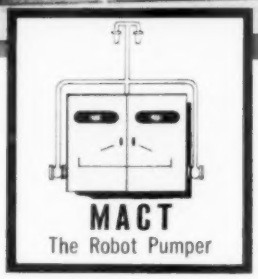

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Golf goes on unhampered by Signal Oil and Gas Company's drilling operations at an exclusive Los Angeles club.

Pittsburgh Seamless At Work As . . .

Signal Oil

Pittsburgh Steel Co. Casing Scores on Cramped Golf Course Location in Los Angeles

Safety "hard hats" and golf balls aren't usually associated, but then, neither are oil well drilling and the fine art of camouflage.

Yet, all four figured in when Signal Oil and Gas Company started drilling for oil from a tiny "island" in the middle of an exclusive Los Angeles country club.

Before it could put drilling crews in the fashionable Beverly Hills-West Los Angeles section, Signal and Richfield Oil Corporation—its affiliate in the venture—had a host of problems to solve.

They were smack up against tough Los Angeles zoning restrictions requiring drilling operations to be both sound and sight-proofed.

The area over the 40-acre community holding is heavily built up. The only available drilling site was a plot—less than 100 by 100 feet—alongside the left boundary of No. 1 fairway at Hillcrest Country Club. The well was to bottom out nearly a mile from the drilling platform.

Signal's first move was to scoop out the drilling site to lower the operation and thus, better conceal it. The 140-foot drilling rig had its profile spruced up and then was promptly and completely enclosed with sound-deadening padded plastic.

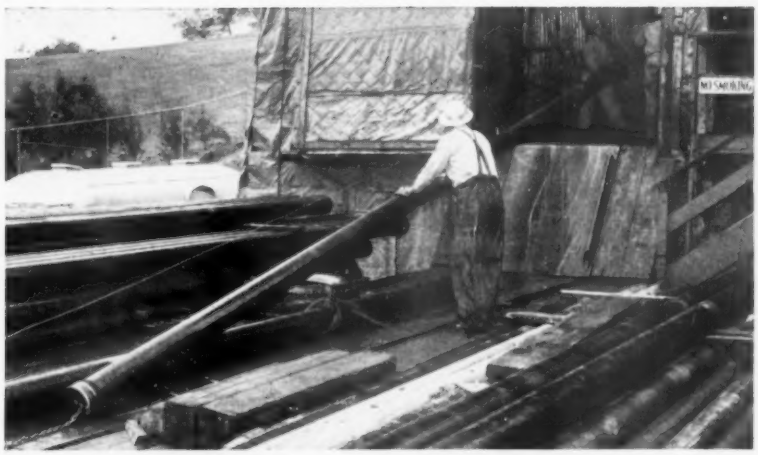
• **Sky-blue Top**—Next, a landscaper applied nine different colors of paint—from foliage green around the base of the rig to sky-blue at its top. Big trees and other foliage were transplanted to help hide the drilling operation.

Instead of the usual Diesel power, electric units specially designed for quiet operation were set up. After the first well on the site was spudded in, waste materials had to be trucked out, but only during daylight hours.

Country clubbers and neighboring residents quickly became accustomed to the drilling operations. And there was no interrupting the "hooks" plaguing a few of the golfers. In fact, roughnecks soon found that their hard hats furnished good protection against in-flight golf balls.

• **Start Third Well**—By the time Signal had proved the first two wells and started the third, indications were strong that the Hillcrest ven-

and Gas Co. Drills Off The First Tee



Pittsburgh Steel's Seamless Casing was run during daytime by crews who worked in sound and sight-proofed rig.

Quickie thread protectors are removed just before the length of casing is added to the 8200-foot string.

ture would develop into a good paying site.

Signal—founded in California 37 years ago and now among the leading world-wide operators—takes severe drilling angles in stride. The company claims a record established during 1958 for completing 87 wells with drift angles of more than 60 degrees.

Although Signal prefers not to publicize its specific costs, there's no hiding the fact that drilling in Los Angeles piles considerable cost on top of normal land operation costs. One oilman who knows the area maintains it costs three times as much to drill there as anywhere in the nation.

• **No Needless Gambles**—That's why Signal can't afford to take a chance on less than the best in materials and equipment it uses. Failures in either would impose extra cost penalties.

Signal has to insist on top-quality material, such as Pittsburgh Steel's Seamless Oil Country Goods. Pittsburgh's 7-inch, 23-pound J-55 Casing—meeting all API specs fully—went into the 8200-foot casing string in the third Hillcrest well. Near the top of the string, Pittsburgh's Seamless was used for tension strength; farther down, Pittsburgh's Casing provided collapse resistance.

Pittsburgh Steel is a direct supplier to Signal, combining top-quality seamless with up-to-the-minute engineering and sales service. Like Signal, Pittsburgh Steel is an oil country veteran, one with more than 50 years of producing to serve oilmen

In the remainder of the oil country, Pittsburgh Steel backs up its own service through a network of independent distributors, themselves local businessmen who know the oil industry inside and out.

To put Pittsburgh's quality consciousness and its extensive steelmaking experience at your disposal, contact Pittsburgh Steel's oil country offices or any one of its distributors listed below.

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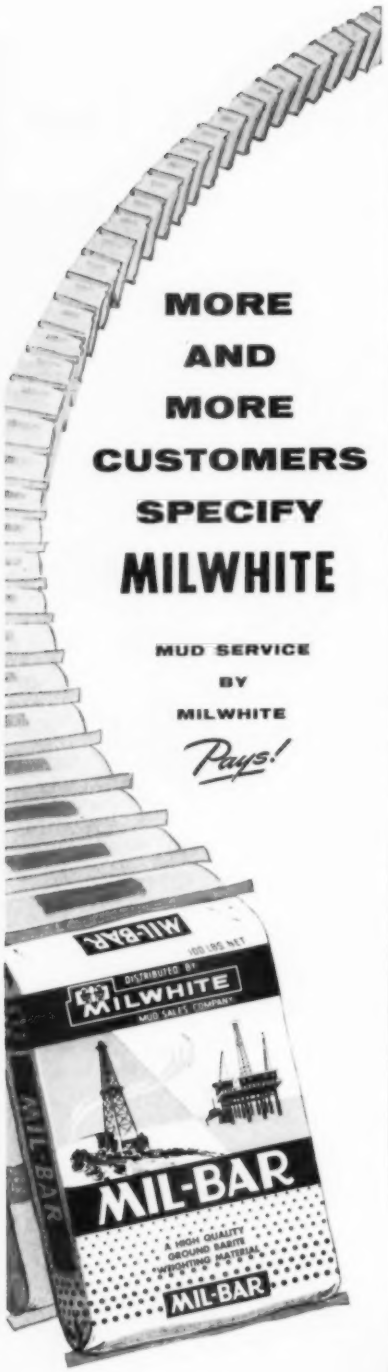
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For corrosion control . . .

Inhibitor Squeeze Usage Grows

Look for a continued growth in the use of inhibitor squeeze to control corrosion in tubing and downhole equipment.

Inhibitor squeeze—a means of forcing corrosion inhibitor into the producing formation, to be given up as the oil is produced—was first tried in Placedo field, Victoria County, Southwest Texas, in November, 1954, by Sunray Mid-Continent Oil Co.

Since that time, it has been used successfully in hundreds of gas-distillate, gas-lift, and pumping oil wells, primarily along the Texas Gulf Coast and in Louisiana.

One major service company—among the leaders in inhibitor squeezing—estimates that it will perform more than 2,000 inhibitor squeeze jobs in the Texas Gulf Coast area and Louisiana alone during the next 24 months.

Because the duration of its effectiveness—four to six months in most cases—the method is believed to hold great promise for automated leases and in areas where wells are inaccessible part of the year.

Numerous successful applications have been reported for wells in Canada's muskeg area, where heavy equipment dare not venture until winter weather freezes the muskeg.

In addition, river bottom sites, remote single-well locations, and multiple-completion and high-pressure gas-condensate wells offer special incentives for the use of inhibitor squeeze.

A few outstanding successes have been reported in West Texas. But as for the Mid-Continent area, one service company engineer says, "Right now we are where we were in South Texas four years ago."

Inhibitor squeeze differs from conventional methods of corrosion-control in several ways.

Among them:

(1) A well does not have to be shut down following the inhibitor-squeeze treatment.

(2) High pressure in wells does not prevent the inhibitor from reaching the bottom of the well.

(3) It does not require permanent installations to inject the inhibitor into the well at intervals.

(4) It can be used for multiple completions, since the annulus is not filled with the inhibitor.

In basic application, inhibitor squeeze is very similar to oil well acidizing, and standard acidizing units usually are used to pump the inhibitor into the well.

After the inhibitor has been pumped down the tubing, it generally is followed with an overflush of oil to force it into the formation.

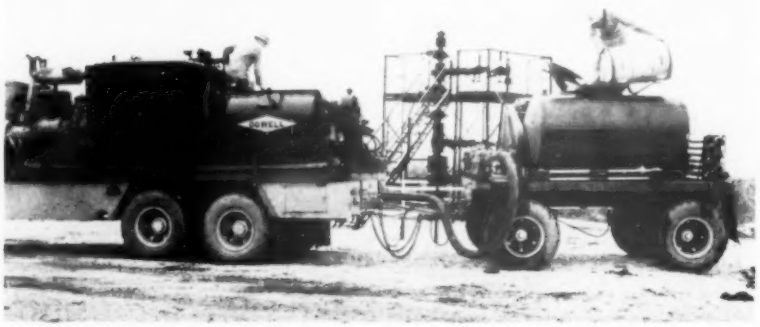
The theory—which is borne out in practice—is that the well fluids pick up small quantities of the inhibitor and provide continuous protection as the oil flows or is pumped from the well.

Injection rates for inhibitor squeeze vary according to the individual wells being treated.

The maximum pumping rate for low-pressure wells is about 1 bbl. per minute.

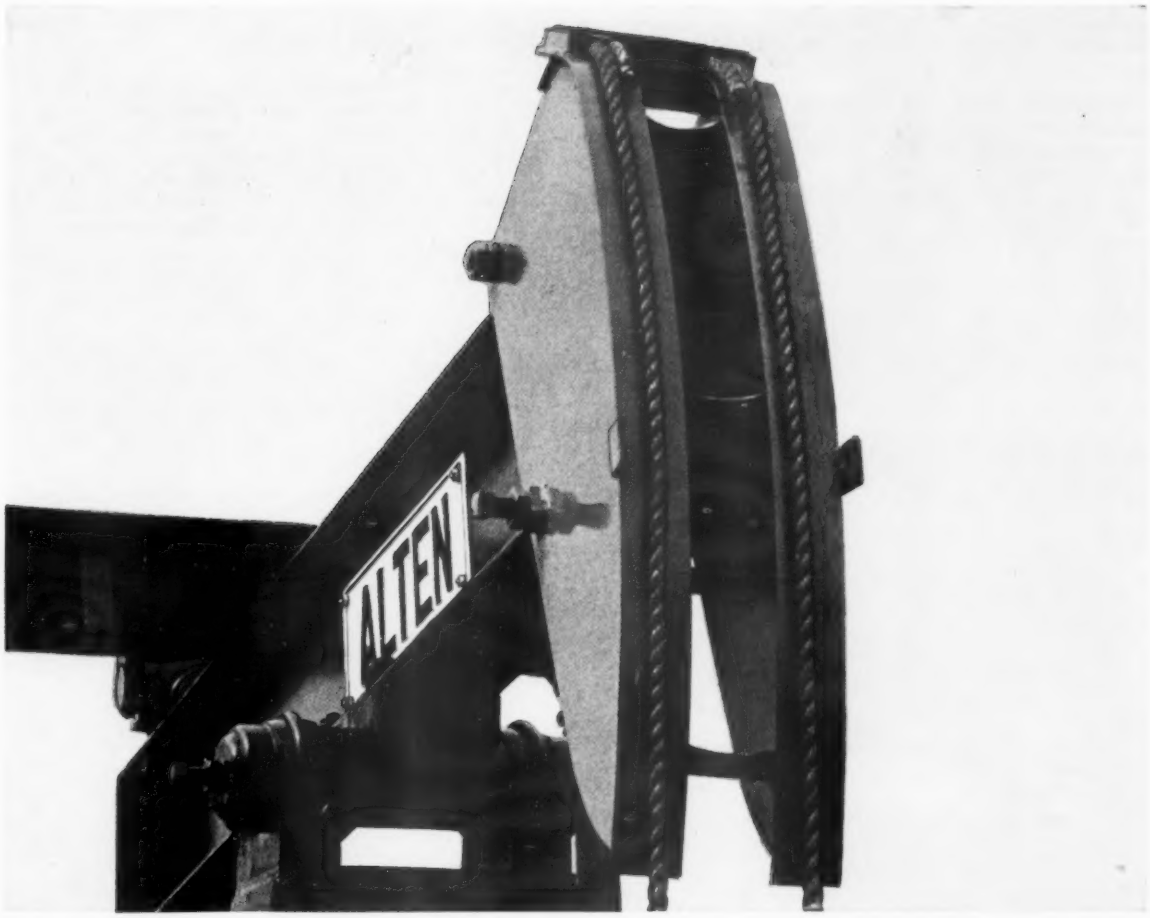
Rates decrease to 10 gal. per minute or less according to pressure limitations. Practice has shown the desired rate of injection to be the minimum practical after the formation begins taking fluid.

The objective is to minimize the fracturing effect on the formation



CHEMICAL INHIBITOR for squeeze job on gas-condensate well near Lafayette, La., is poured into truck tank, prior to being pumped into the producing formation.

engineering and sales service. Like



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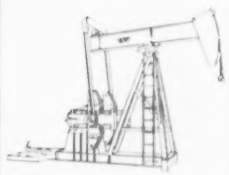
The horsehead of an Alten unit makes servicing your well faster and easier. Remove one bolt and the horsehead swings back over the beam. Or remove the horsehead completely.

Perfect alignment with the well is made possible by means of a radiused support between horsehead and beam. Simple adjusting screws make and maintain alignment.

Positive self-locking wire line clamps let you change the wire line in minutes. These clamps also permit adjustment of the polished rod hanger to the proper height above the well head.

Isn't this the kind of practical engineering you want built into every part of your pumping equipment? Save time. Call your Alten dealer first.



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while distributing the inhibitor over the widest possible section of the pay face.

Equipment costs for inhibitor squeeze vary widely—from $30 to a maximum of $960 that was reported for one well.

Generally, the higher the well pressure, the higher the cost of the treatment. Figures presented at a recent symposium of the National Assn. of Corrosion Engineers showed average costs of $30 to $80 for wells with pressures up to 200 psi.; $50 to $150 for wells with pressures between 200-300 psi.; and $150 to $200 for wells having pressures in excess of 300 psi.

Cost of the inhibitor itself runs about $100 per well, based on an average injection of 50 gal. per well at an average cost of $2 per gal.

About half of the operators in South Texas and Louisiana have reported using 1 part inhibitor with 1 to 5 parts of oil. The other half uses a mixture of 1 part inhibitor with 5 to 25 parts of oil.

No conclusive evidence is available as to which proportions are the most effective.

More than 30 different chemicals have been used for inhibitor squeeze, but so far they have not differed appreciably from those used in the more conventional corrosion-mitigation methods.

The only change has been one of technique.

Most of the chemicals used are of the amine class, usually derived from the fatty acids by nitrogen substitution.

All are surfactants, and most are oil soluble or oil soluble-water dispersable. Water soluble inhibitors also have been tried, but not to any great extent.

Research, however, is continuing with the aim of developing an inhibitor designed specially for squeezing and having a longer film life.

Inhibitor squeeze treatments are not considered successful unless they provide protection for at least four months.

Six months is the average life for the squeeze method, and cases of protection for up to 16 months have been reported.

A recent report gathered from 12 companies operating a total of 260 wells showed that 91% of the wells retained at least some portion of the inhibitor's beneficial effects for periods exceeding four months.

Success or failure of the treatment is based on an iron count in produced fluid at intermittent periods following treatment or, in some instances, a caliper survey.

Using iron count as the criterion, failure of dissolved iron in the well fluid to go below the level prior to treatment is indicative of failure.

In many instances, a sharp increase in iron count after inhibitor squeeze, followed by a gradual decline, has been noted. A drop in the iron count, followed by a rise some months later, indicates that the treatment was successful, but that the inhibitor has been expended.

Caliper surveys have been used to detect pitting of the tubing as a result of corrosion. If the squeeze is successful, pitting will be arrested, and periodic caliper runs following treatment will reveal a status quo.

In a few isolated cases, the well's production has fallen off following inhibitor squeeze.

Most of these cases have been traced to water-sensitive sands, and have been remedied by oil squeezing or by allowing the well to return on its own within 30 to 60 days.

On the other hand, production from some wells has been stimulated by the cleaning action of the inhibitor.

But the great majority of wells subjected to inhibitor squeeze have been unaffected as to production rates.

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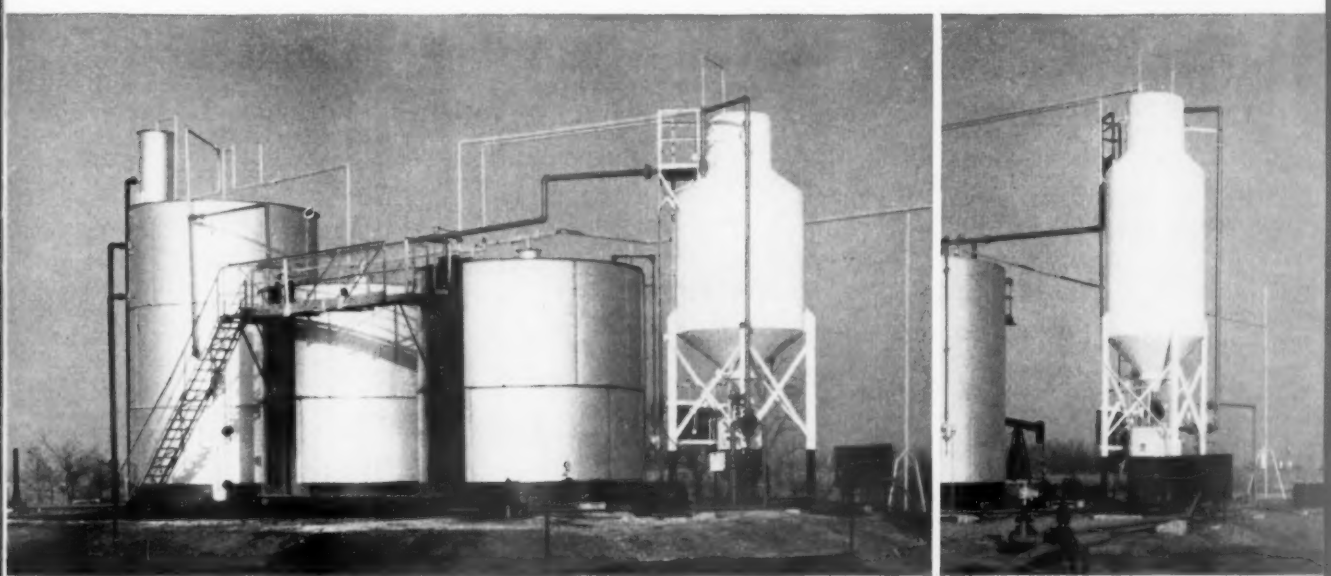

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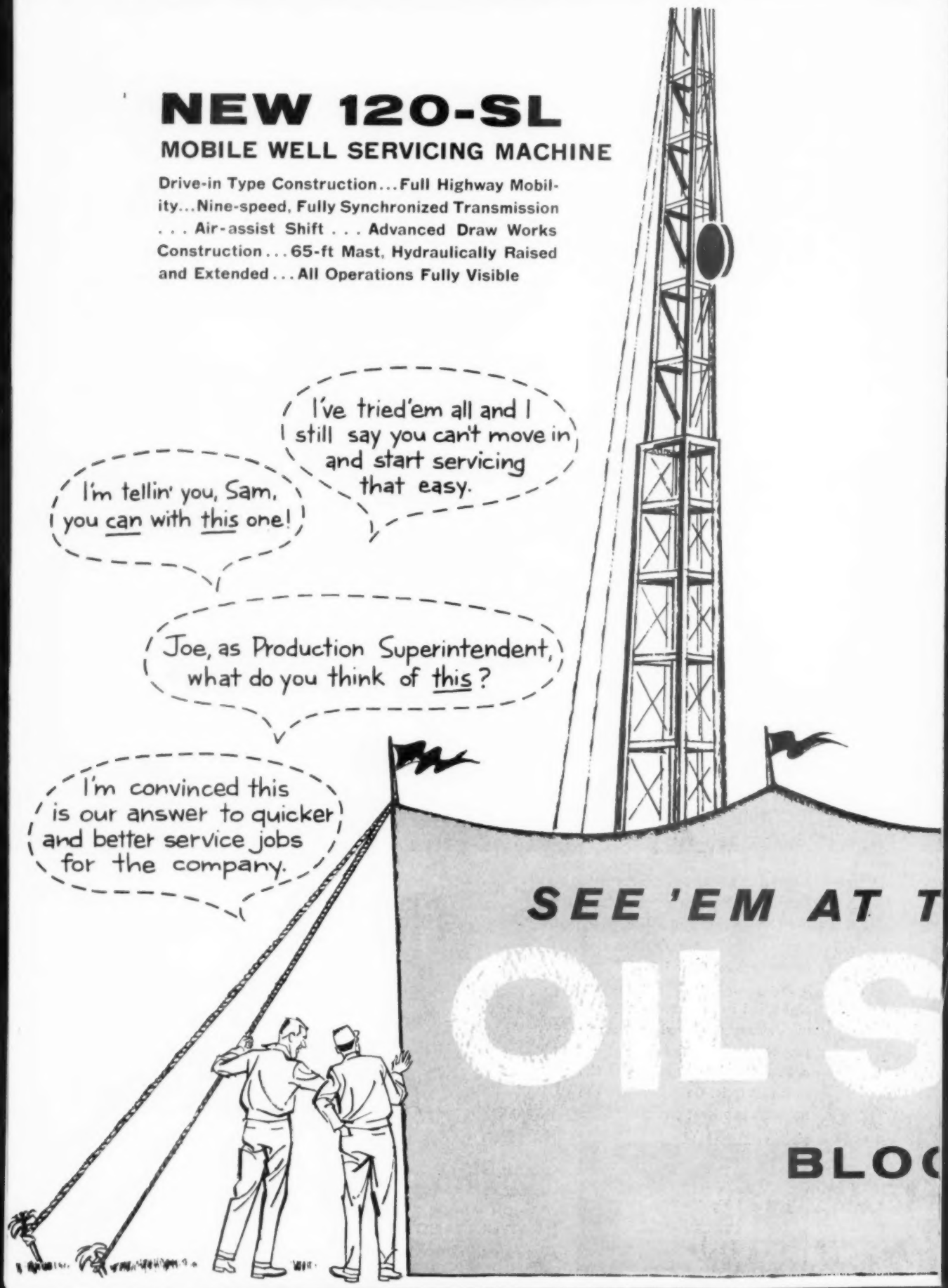

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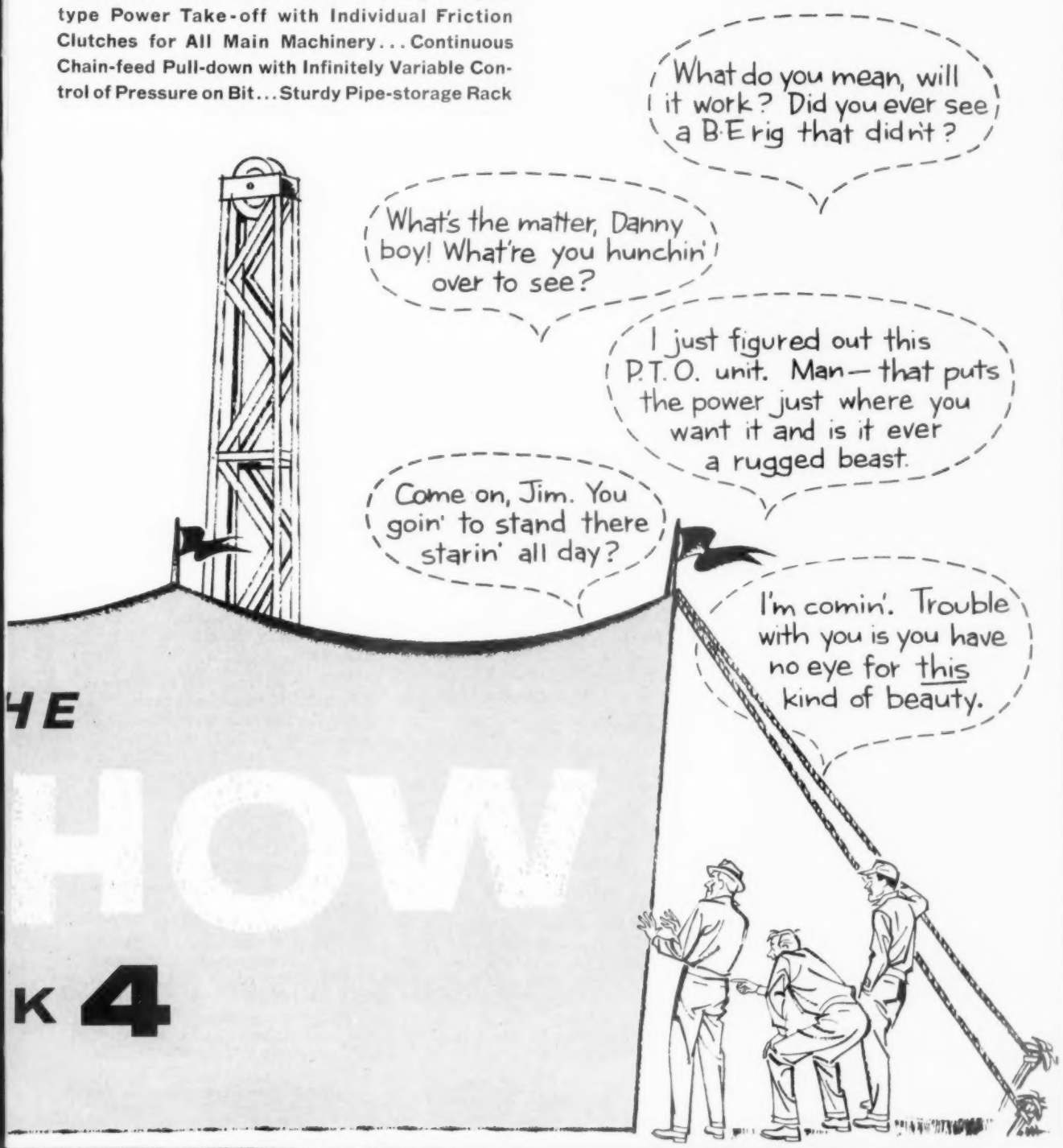

What do you mean, will it work? Did you ever see a B-E rig that didn't?
What's the matter, Danny boy! What're you hunchin' over to see?
I just figured out this P.T.O. unit. Man— that puts the power just where you want it and is it ever a rugged beast.
Come on, Jim. You goin' to stand there starin' all day?
I'm comin'. Trouble with you is you have no eye for this kind of beauty.

HE

HOW

K 4

North Dakota Drilling Record Likely

A high drilling rate in North Dakota's Burke and Bottineau Counties, coupled with a steady demand for crude from that area, appear to be leading the state toward another record year.

It looks now as if a new drilling record for the state could be set this year.

Last year's record total of 424 holes drilled considerably exceeded rather pessimistic predictions made at the beginning of the year by some observers.

Far from showing the predicted reduction in over-all work in 1958, North Dakota set new records not only for drilling, but for number of discoveries and for percentage of exploratory successes.

While the number of holes drilled in the first quarter this year is two behind the same period in 1958, new locations have been announced in the past two months at a much faster rate than last year.

At last report, 42 rotary rigs were active in the state, with the total continuing to increase weekly.

Burke and Bottineau Counties accounted for seven of the eight North Dakota discoveries in the first quarter of this year.

This impressive record was compiled despite the fact that the two counties accounted for less than half of the state's total exploration in that period.

Of the half-dozen wildcats drilled in Burke County through March, four resulted in discoveries. Three of six wildcats in Bottineau County were successful.

In the same three months, the total for the rest of the state was one discovery out of 14 wildcats.

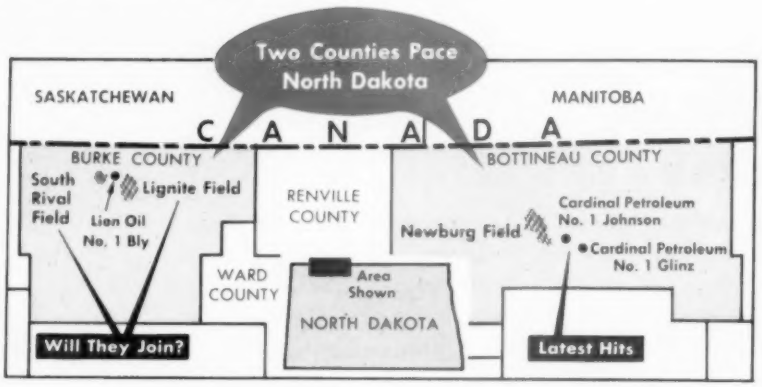
The two counties prove that a persistent and widespread exploration program can succeed even in the face of negative evidence.

Negative evidence aplenty was accumulated through the first four or five years following the emergence of North Dakota as an oil producing state in 1951.

The two counties lie east of the Nesson anticline, where the state's first commercial production was found at Beaver Lodge and Tioga fields.

After the production break-through, a rash of exploratory drilling to the east through most of the state's Williston Basin area found nothing more than some apparently small pools in Bottineau County.

Before the discovery at Lignite field, Burke County, in 1957, some leases in the area were being dropped. What drilling there was, was done on farmouts from major companies, which had large leases in the area.



Small discoveries, including many of those made before 1957, provided continued encouragement, but in many instances the discovery was not an economic success.

In several cases, only later successful development drilling put a brighter light on the two counties.

An excellent example of this is Newburg field, Bottineau County.

The discovery well was drilled by Amerada Petroleum Corp. in mid-1955. It produced 28 b/d of oil along with 26 b/d of water from the basal Spearfish.

There was no further drilling in the field until 1957, when Amerada completed a 121 b/d producer 1½ mi. north of the discovery, from the Spearfish and the underlying Charles.

This well touched off a continuous development program that led to 78 producers by the end of 1958. Production has totaled 750,269 bbl. of 37-gravity oil. More than 500,000 bbl. of this was produced during the second half of last year.

By the end of March, 1959, 11 more producers had been added to Newburg field.

Newburg is on the east flank of the Williston Basin. Production is from the Jurassic-Triassic Spearfish section, which lies unconformably on the truncated Charles of Mississippian age.

Production generally is found between 3,400 ft. and 3,500 ft.

The 1957 Lignite field discovery in Burke County, in contrast, was a good producer, a rarity for the area east of the Nesson anticline at that time.

Northwest Oil Drilling Co.'s No. 1 Bunting, section 5-162n-92w, flowed 224 b/d from the Midale zone of the Madison (Mississippian).

By the end of 1958, operators had drilled 25 producers in the field, 18 of which were on pump. Total production to Jan. 1, 1959, was almost 382,000 bbl. of 38.7-gravity oil.

Through March three more wells had been completed in the field.

There is heavy current interest in South Rival field, discovered a year ago.

In March, 1958, Northern Pump Co. completed a 216 b/d discovery in section 34-163n-92w, west of the north end of Lignite field, to open the field.

Interest spurted in this area early this year when Pan American Petroleum Corp. completed a 1,200 b/d well less than a mile north of the discovery.

In the meantime, Lion Oil Co. drilled a 40-bbl.-per-hour well between Lignite and South Rival, opening the possibility of eventual junction of the two fields.

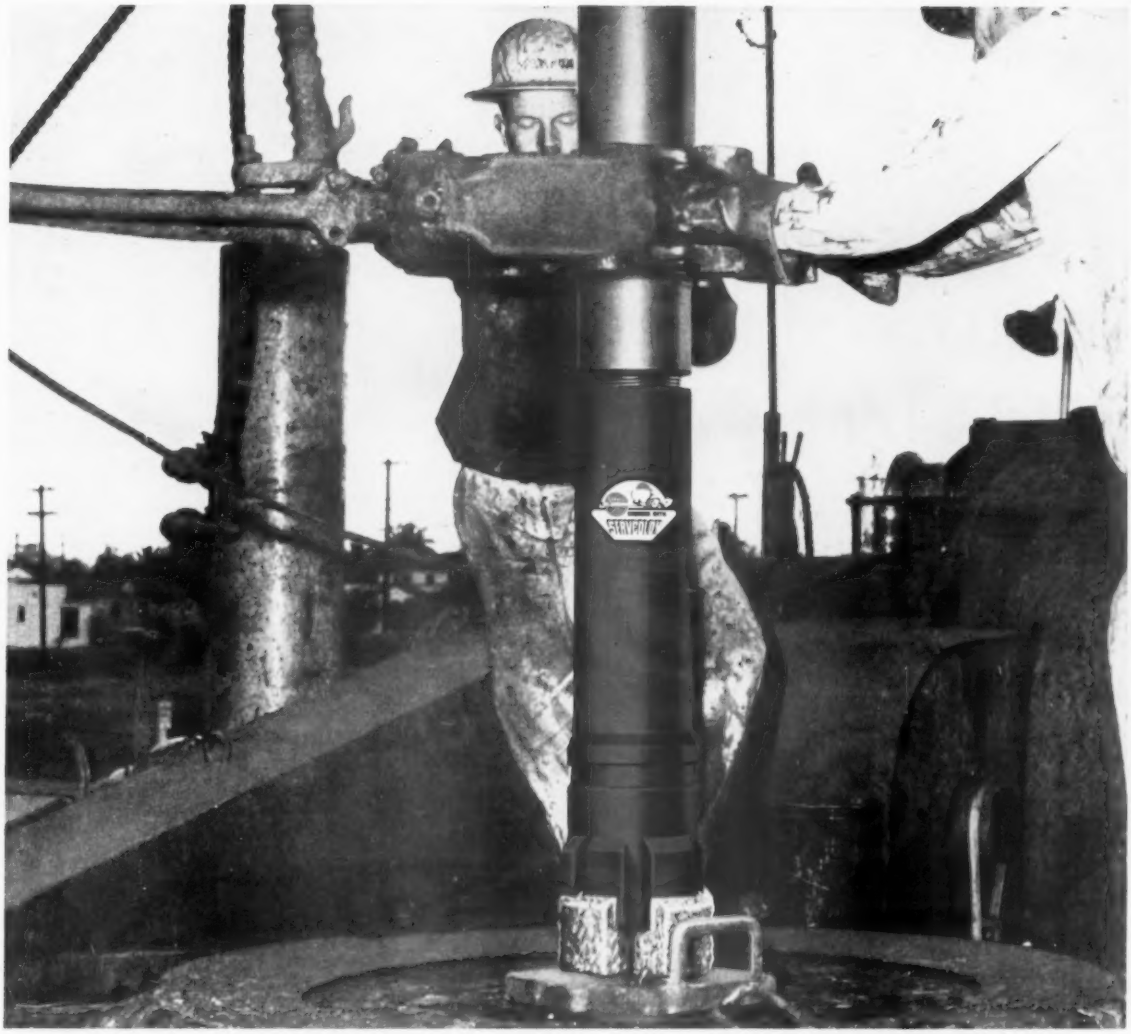
South Rival had four producers by the end of last year, and five more were added by the end of March of this year.

The interest generated by successes at Lignite, Newburg, and South Rival fields has led to a rapid increase of exploration.

Discoveries have been made south of Lignite, in the newly-named Rennie Lake area, and three new pools have been opened up south and east of Newburg field.

Some 2½ mi. east of Newburg, Cardinal Petroleum, Great Plains Royalties, and W. C. Kaufman completed No. 1 Johnson, section 20-161n-78w, for 94 b/d of oil and 11 b/d of water from the Midale zone of the Madison and the Spearfish through perforations at 3,266-70 ft. and 3,301-17 ft.

And 3 mi. southeast of this well, the same group completed No. 1 Glinz, section 34-161n-78w, confirm-



Three 6⅛" Bit Cones milled up in 2 HOURS!

Servcoloy-dressed Junk Mills chew up bit cones and other junk with amazing speed; makes this method of removing a fish fast, safe, and very economical.

After three cones from a 6⅛" bit were left on bottom, two rock bits, two hydro-bailers, and two junk baskets were run during a three-day period in attempts to either recover or sidetrack the three cones. Results were negative.

A six-inch Servco CJ Junk Mill dressed with Servcoloy, was then run in the hole. A total of two feet of hole was drilled in a period of two hours of milling. The operator ran back with a bit and proceeded to drill a head. Fine steel cuttings were caught on the shaker during the milling and appeared on the mud screen during the succeeding day, showing that the *cones were actually milled up, not sidetracked.*

Other operators running the Servco Junk Mill report similar results. The astonishing cutting properties of Servcoloy have completely changed thinking about down-hole milling. Why not get complete information from your nearest Servco office?

WHAT IS SERVCOLOY? *

Servcoloy is a patented, hard-facing material which uses a unique method of suspending bits of carbide in a tough, elastic matrix. As the carbide cutting edges are worn away or torn from the matrix, new edges are automatically exposed. Servcoloy is now being used on Servco milling tools such as section mills, rotary shoes, taper mills, pilot mills, etc. Remedial work which formerly took days to do is now being done in hours.

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The last 2637 feet of a 14,383 foot hole recently completed required only three HYCALOG V-DOOR diamond bits. Each stayed on bottom, making hole continuously until replaced. Here's the breakdown of each bit's performance:

From 11,744' to 12,792' a total of 1048 feet was drilled in 215 hours, averaging 5.0'/hr.

From 12,792' to 13,925', a total of 1133 feet, drilling time was only 240 hours at an average of 5.1'/hr.

From 13,925' to 14,383' (TD) totaling 458', drilling rate was increased to 5.5'/hr. And the bit, when pulled, was still in excellent condition.

The savings on this hole is enormous when performance of the V-DOOR bits is compared with the number of conventional rock bits . . . *and round trips* . . . which would have been required to make the same footage.

This is another of a growing heap of such records being set almost daily by HYCALOG V-DOOR *bits. Why not let* V-DOORS *set a record on your next drilling program?*

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ing a new Spearfish-Charles pool opened recently by No. 1 Kaeding.

The third new pool was opened south of Newburg by McAlester Fuel Corp's No. 1-A Christenson, section 1-160n-79w, completed for 75 b/d of oil on the pump plus 12% water from the Charles. Total depth was 3,480 ft.

And a lot of attention is focused on The California Co.'s No. 4 Henry, which is drilling below 6,600 ft. on its way to the Pre-Cambrian around 7,200 ft., an unusually deep test for the Newburg area.

The strong drilling pace and interest has prompted one major company official to predict a tightening of farmout programs.

"We'll not be so liberal with acreage in our future farmout programs in North Dakota," he says. "It looks now as if cash participation, with acreage mostly reserved to the company, will be the better course in view of recent developments."

Louis L. Larson, statistician for the North Dakota Geological Survey, says production per well-day in the area has not been high, but that it has steadily increased since 1956, mostly because of Lignite and Newburg fields.

"If this trend continues," he says, "then there should be an increase in both wildcat and development drilling activity in both counties."

Much of the crude from this area is shipped east to the Minneapolis area by tank car.

There is little current or planned natural gas distribution activity in the general Minneapolis area.

So far, market demand proration has not been imposed on North Dakota's District 2, which covers all of Bottineau County and most of Burke County.

New Motion Filed In Lease Dispute

The U.S. Attorney General's office is asking a federal court to dismiss Pan American Petroleum Corp.'s motion to enjoin the Bureau of Land Management from canceling 86 oil and gas leases in Wyoming.

In filing the dismissal motion in U.S. District Court in Cheyenne, Wyo., U.S. Attorney John F. Raper, Jr., contended that BLM has the authority to cancel any oil and gas leases obtained "by fraud," and that Pan Am had not exhausted its administrative remedies.

Pan Am sought an injunction after BLM moved last January to cancel the leases (PW—Mar.6'59,p19).

Robert S. Barnwell, Jr., President
Barnwell Offshore, Inc.

"MR. CAP" stands out in "DRILLING EFFICIENCY"

Barnwell Offshore, Inc., Shreveport, La., has this to say about the performance of their LeTourneau built mobile offshore drilling platform: "More and more it appears that *efficiency of equipment* and *economy of operation* are the primary requisites to obtain offshore drilling contracts. And, since 'Mr. Cap' possesses both of these to a high degree, our position improves with each hole we drill and our reputation gains accordingly.

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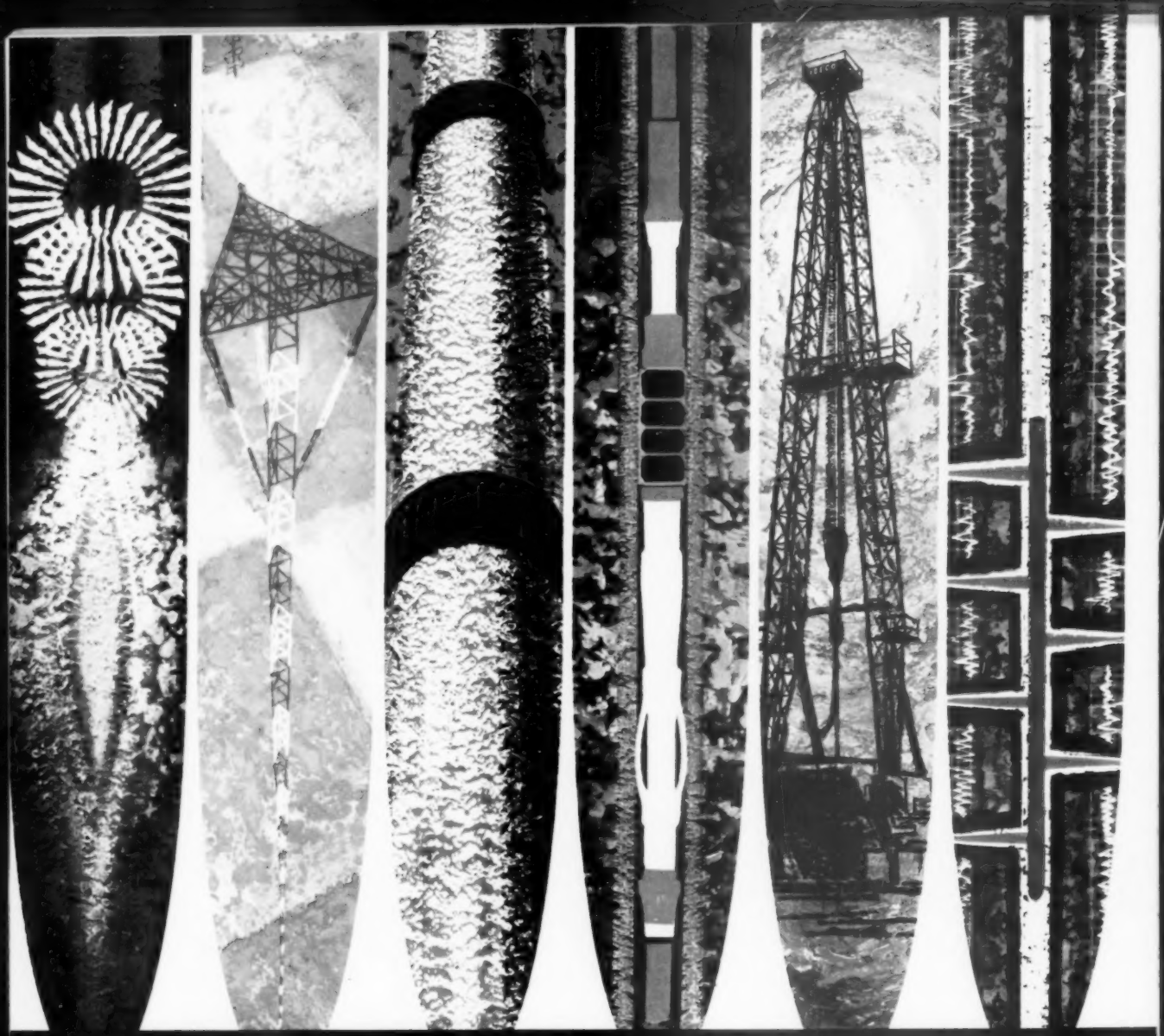

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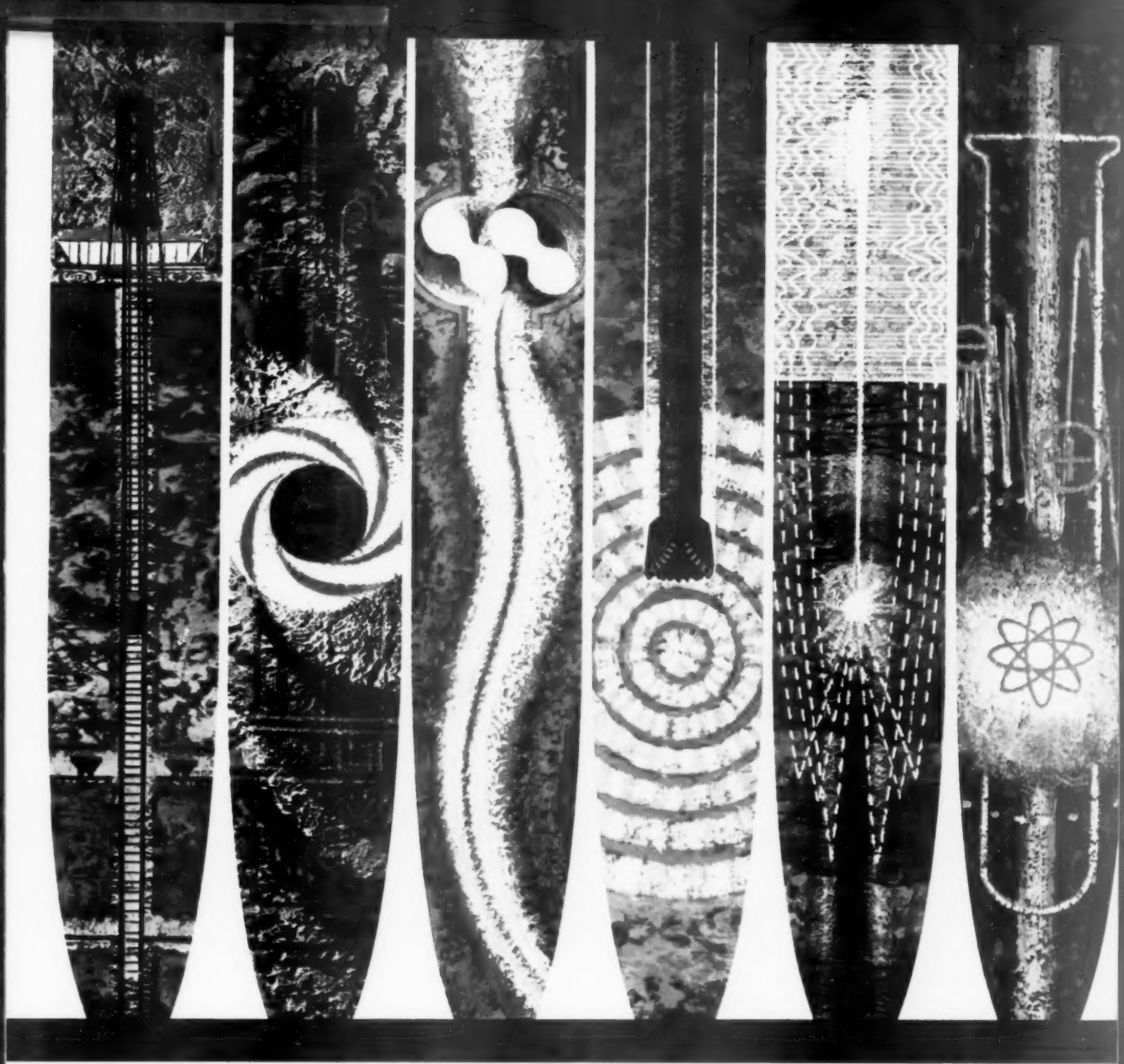

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PART-TIME COWBOY Louis Abacherli, also a farmer and oilman, finds that his . . .

Horse Helps Tend Rugged Lease

A figure from out of the past—an oil man on horseback—rides the range in a rugged little California oil field.

It's a common sight in Mahala field, 6 mi. south of Chino, San Bernadino County, to see Louis Abacherli making his rounds on horseback, tending to the diverse duties of part-time oil man, dairyman, farmer, and cowboy of sorts.

The 25-year-old Abacherli helps care for the Abacherli ranch, site of the major part of Mahala field. The ranch came into the family in 1921 when young Louis' grandfather established it.

The 930-acre ranch covers sometimes flat, sometimes rolling, and often rough terrain.

All of the field's nine producing wells (300 b/d of 26.5-27-gravity oil and 160,000 cf/d of gas from the Puente sand [Miocene] at about 1,500 to 2,000 ft.) are situated on a ridge, or hogsback, making horseback a sometimes best means of getting around.

Aside from picturesque aspects, Louis Abacherli represents a sound solution for General Petroleum Corp. to the knotty problem of how to operate a small, relatively isolated field.

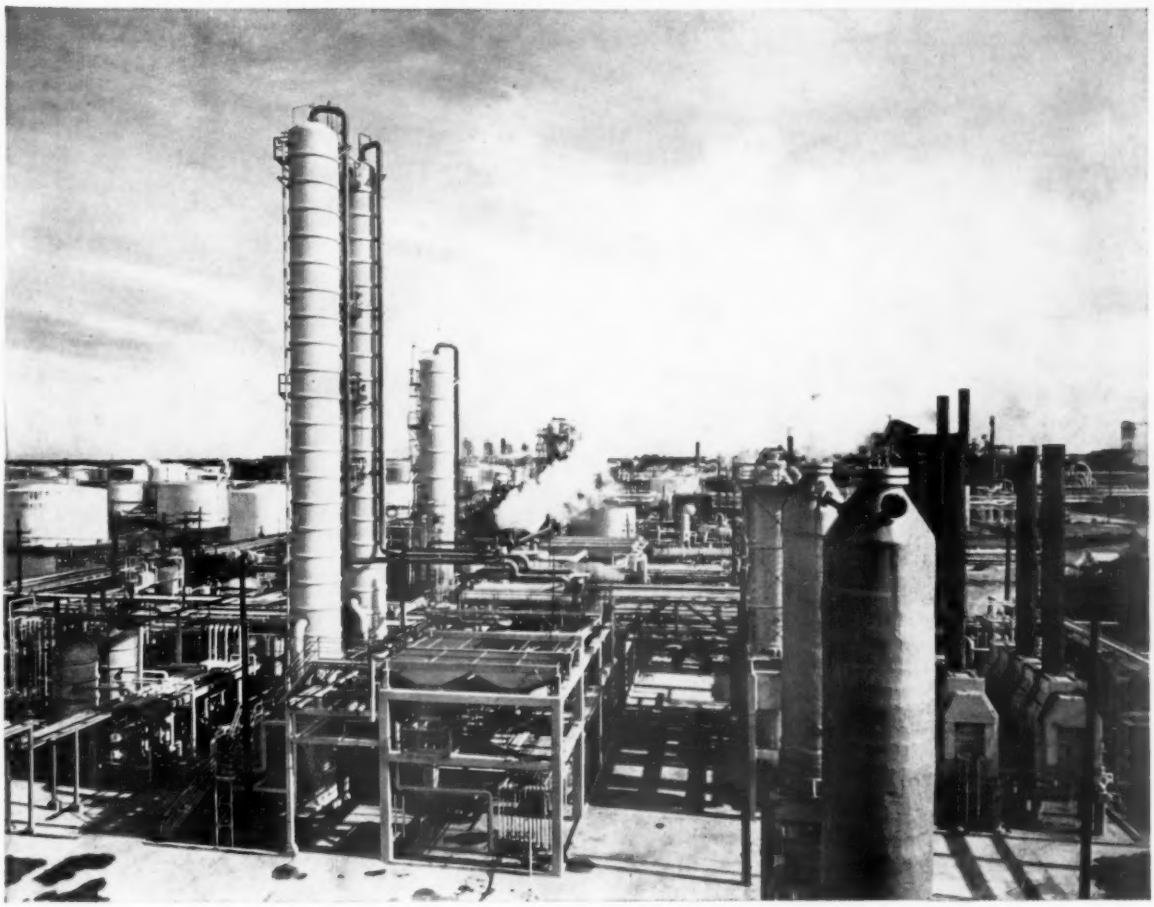
General Petroleum acquired the field last year for $118,000, subject to oil payments out of production amounting to $522,000. Majority owners were James Michelin of Arcadia and W. M. Thornbury and W. H. Geis of Los Angeles.

Looking after the field did not represent a full-time job, and the fact that the field was relatively removed from other company installations made it impractical to add Mahala field duties to those of existing personnel.

The part-time oil man's job mainly involves making certain all of the wells are functioning properly and supervising the work of a dewaxing company when the wells are serviced to cut down paraffin content.

It is necessary to dewax the wells every three months. This is done by pumping about 100 bbl. of hot oil—from 230F to 300F—into each well. The process takes about three hours per well.

Heated oil melts the wax and enables the oil to flow more freely. In addition, the process also has slightly stepped up production. It takes about a day and a half to recover the hot oil.



HYDROFINING REPLACES ACID TREATMENT

To eliminate pollution of air and effluent water, reduce operating costs, and to produce a sulphur free finished product, a large Gulf Coast refiner recently placed in operation the above pictured 6000 barrel per day HYDROFINING Unit designed to supplant acid treatment in processing close boiling range naphthas.

Feed stock is vaporized and mixed with hydrogen which catalytically reacts with sulphur contained in the feed stock mostly in the form of mercaptans, to form hydrogen sulphide which is further processed to recover elemental sulphur. After HYDROFINING the liquid product is washed with caustic and filtered through charcoal.

HUDSON furnished mechanical design, materials and equipment; and constructed the HYDROFINING Unit and the Fractionating Unit shown at the left of the picture.

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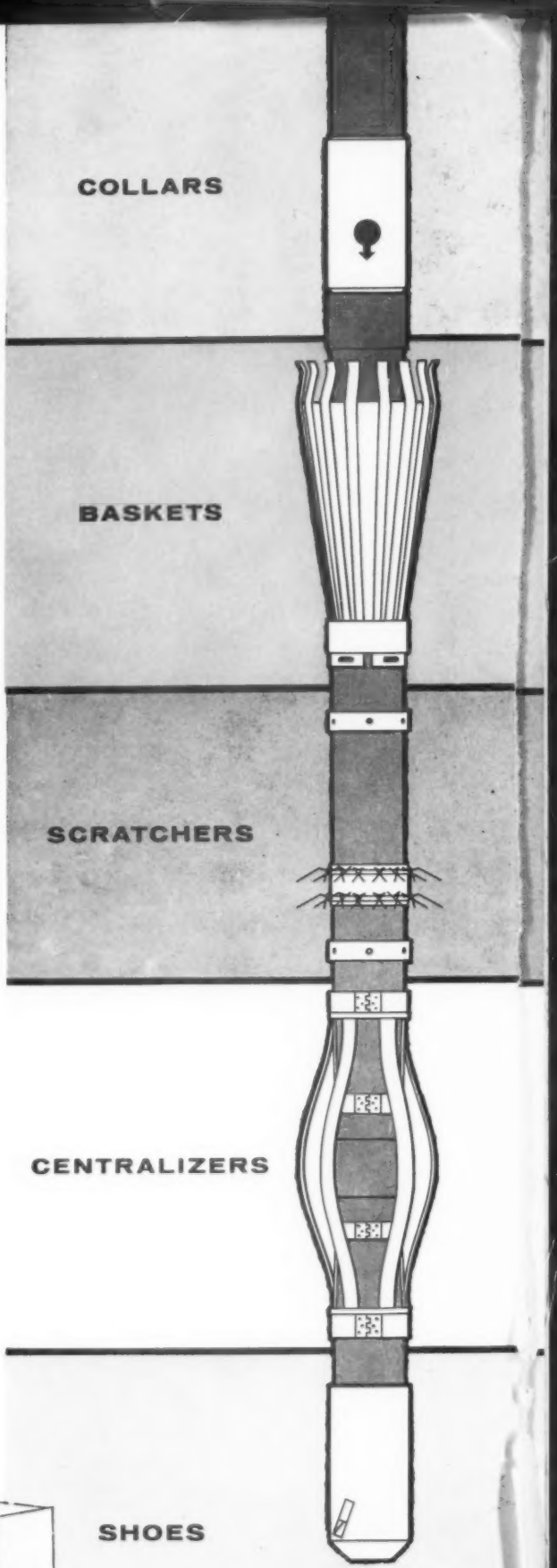

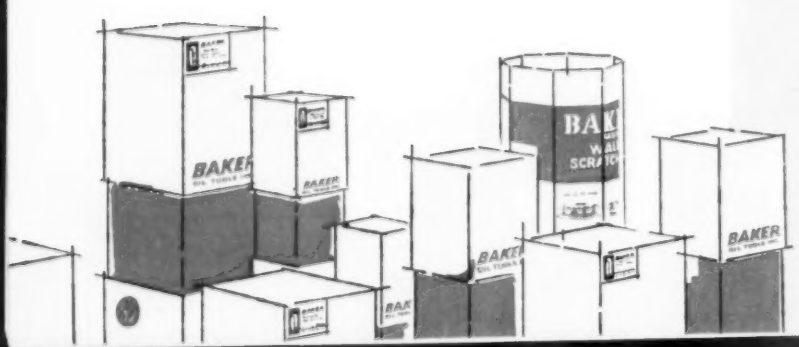

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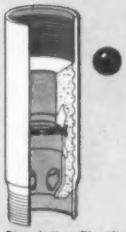
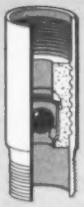
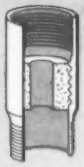
Fill-Up Collar
Product No. 161 M&F



Circulating Flexiflow
Fill-Up Collar
Product No. 161-D M&F



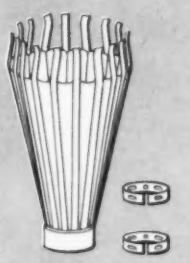
Cement Float Collar
Product No. 101 M&F



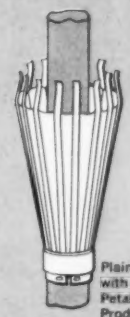
Cement Baffle Collar,
with Holes
Product No. 104 M&F

Cement Baffle Collar,
Solid
Product No. 105 M&F

Triplex
Flapper Valve
Float Collar,
Product No. 134 M&F



Metal Petal Basket,
with Stop Rings
Product No. 343



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Scratcher, with
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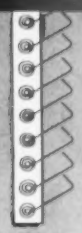
Product No. 900-C

Hinge-Lok Wall
Scratcher, with
2½" long wires
Product No. 900-C

Solid-Ring Wall
Scratcher, with
4½" long wires
Product No. 901-C

Solid-Ring Wall
Scratcher, with
2½" long wires
Product No. 901-C

Auto-Grip
Stop Rings
Product Nos.
938 (Solid)
and 939 (Split)



Rotating
Wall Scratcher
Product No. 903

"G-12" Slim Hole
Casing Centralizer
Product No. 910-G

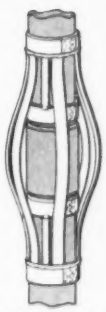
"G-20" Solid-Ring
Casing Centralizer
Product No. 910-G

"HN-15" Solid-Ring
Casing Centralizer
Product No. 908-HN

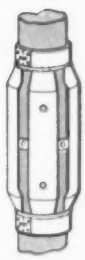
"HN-20" Solid-Ring
Casing Centralizer
Product No. 908-HN

"H-15" Hinge-Lok
Casing Centralizer
Product No. 9115

"H-20" Hinge-Lok
Casing Centralizer
Product No. 9112



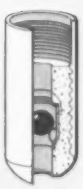
"H-25" Hinge-Lok
Casing Centralizer
Product No. 9113



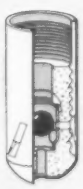
Hinge-Lok Rigid
Casing Centralizer
Product No. 9133

Differential
Fill-Up Shoe
Product No. 1081

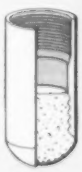
Flexiflow
Fill-Up Shoe
Product No. 160



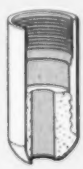
Cement
Float Shoe
Product No. 100



Cement Wash-Down
Whirler Float Shoe
Product No. 120



Cement
Bull Plug Shoe
Product No. 103



Cement Guide Shoe
Product No. 102

Triplex Cementing Shoe Product No. 1363

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A NEW LOOK AT LOGGING

You'll profit by seeing Welex's new full-color movie "THE OILMAN'S PROPHET", a new look at logging. Now for the first time, the mysteries of oilwell logging are unfolded and simplified for your profit. Produced by Welex, leaders in logging, the movie's premiere will be held at the International Petroleum Exposition, Tulsa, May 14-23. The place—Booths 57 and 58, Texas Building. Here's your ticket. Don't miss it.

**Following the show, "The Oilman's Prophet" will be available for loan to companies and organizations.*

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What's New / IN EXPLORATION, DRILLING, PRODUCTION

Biggest East Texas Unit Project Planned

An operators' committee has been formed to study establishment of the largest unitized pressure-maintenance project in East Texas, in terms of acreage and wells involved.

The planned unit would cover the Pettit (Lower Cretaceous) limestone oil reservoir in the Tatum field, centered in the northeast corner of Rusk County.

The unit would take in about 6,000 acres, extending into northwest Panola County, and would include 89 producers from the 7,000-ft. Crane zone of the Pettit. The wells have an average pay thickness of 5½ ft.

Operators backing the program are Skelly Oil Co., British-American Oil Producing Co., Carter-Jones Drilling Co., Robert Cargill, Fred Whitaker, and J. C. Trahan. These operators control about 95% of the field's working interest.

An engineering committee also has been formed, with Speller & Key, Inc., of Tyler, retained as project developer and consultant for others than Skelly.

Engineering plans call for high-pressure injection of water through 15 injection wells at the rate of 5,000 b/d initially, increasing to 8,000 b/d in two years.

The injection is projected over a ten-year period to provide an estimated total oil recovery of 4.5-million bbl., ten times the present anticipated primary recovery of 400,000 bbl.

•

Court Sets Boundary On Texas Submerged Lands

The Texas Supreme Court has ruled, in effect, that the dividing line between state and private ownership along the Gulf Coast is the "mean high-high water" level.

The court refused a rehearing on a dispute between J. W. Luttes and the state attorney general's office, leaving intact a lower-court ruling to that effect.

Luttes contended that he owned 4,086 acres of mud flats in Cameron County, now leased to Shell Oil Co. for mineral development.

Atty. Gen. Will Wilson argued that the territory in dispute belongs to the state as owner of submerged lands. Wilson added that the decision would adversely affect the state's claims to such land over nearly half the state's coastline.

The case will go back to the Waco (Tex.) Court of Civil Appeals for further argument on the question of whether the trial court's decision was amply supported by evidence.

Properties Change Hands

Control of Commonwealth Drilling Co., Ltd., Canada's largest oilfield drilling company, has been acquired by Southwest Petroleum Co., Ltd.

SP took over the drilling company, which has 28 rigs, by buying controlling interest in Commonwealth Petroleum, Ltd., a holding company. Also

Libyan Sands
Yield Forgotten Arsenal

. . . to GSI crews in their search for oil

Before they can probe the subsurface for geophysical data, GSI field parties in Libya must probe the desert sands for dangerous remnants of World War II.

German Teller mines, British, French, and Italian bombs, artillery shells and other relics of desert fighting are turned up by GSI mine clearance parties in advance of geophysical exploration.

Uncovering and disarming anti-tank and personnel mines isn't usually considered part of a geophysicists' job, but, to get the data its client needs, GSI has taken mine clearance in its stride. GSI counts among its demolition experts former members of the British Eighth Army and Rommel's Afrika Corps . . . now working side by side to reap what they had sown nearly twenty years ago.

In all fields of exploration GSI has the experts and the facilities to get the job done the way it must be done.

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You can "put this in your pipe and smoke it"... Lone Star casing, tubing and line pipe is the most popular in the industry ... because it is tough, dependable and available conveniently right in the middle of the oil country.

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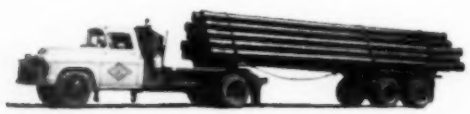
Neighbor, wherever you are, specify Lone Star and we both get a good deal.



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acquired in the $4-million transaction were shares in private companies established by the late F. S. Reeve and Associates.

Alaskan members of Congress are pushing for a more generous limit of permissible holdings of Federal lands in an effort to spur oil development.

Sen. Ernest Gruening and Rep. Ralph J. Rivers, both Democrats, have introduced bills that would set permissible holdings at 1-million acres, including both lease and option acreage.

The state last week approved a 1-million-acre limit for state lands.

The present Federal mineral leasing act permits any individual, corporation, or association to hold 100,000 acres under lease and another 200,000 acres under option.

"Before Alaska's oil potential can be proved or disproved," Gruening told the Senate, "the men who prospect for oil must . . . have access to adequate amounts of land on which to operate before they dare undertake the risks involved . . ."

Petrosur Oil Corp. has acquired a ⅜ working interest in ten oil and two gas wells in Breathitt County, Ky., from Kentucky Drilling & Operating Corp.

The wells are located in Highland Pool field, which covers about 1,000 acres, 3 mi. west of the town of Jackson. Total production from the ten oil wells is about 400 b/d.

An additional 20 to 25 wells are planned for the field.

Siscalta Oils, Ltd., has sold approximately half of its oil and gas assets to Alminex, Ltd.

Under terms of the transaction, Siscalta accepted 445,687 shares of Alminex stock as payment.

Marion H. Stekoll, Texas independent, has acquired controlling interest in Oroco Oil & Gas Co., Salt Lake City, Utah.

Under an agreement approved by Oroco shareholders, Stekoll received majority stock control in exchange for a working interest in Stekoll properties in Hutchinson and Navarro Counties, Tex.

•

Work may start this summer on unitized operation of the Birdsong and Owens sands of the Pettit lime in East Haynesville field, north Louisiana.

Ray Eubanks, petroleum engineer for Hunt Oil Co., says more than 99% of the approximately 50 operators in

the field have signed the unitization agreement.

Royalty owners' agreements are now being sought. When 65% of the royalty interests have agreed, the plan can be submitted to the state Dept. of Conservation. Eubanks says operators hope to have enough signatures to request such a hearing in June. He adds that if approval is given, work will begin in July or early August, with the project to be completed and in operation by October or November.

It's estimated that the waterflood pressure-maintenance project would increase ultimate oil recovery by at least 2-million bbl.

•

The Texas Railroad Commission has been asked by Continental Oil Co. to approve a unitization agreement for Ranch (Strawn) field, Crockett County.

A gas- and water-injection pressure-maintenance program has already been put into effect.

Under the unitization, participation would be based 50% on the number of wells and 50% on acre-feet of pay.

There are three tracts in the unit area, comprising some 1,750 acres, 700 of which are in the participating area. It's estimated the injection will boost recovery by 1,292,000 bbl.

•

Experiments made so far indicate that in-situ combustion may be the key to economic release of oil from Alberta's Athabasca tar sands, a Pan American Petroleum Corp. engineer said last week.

K. L. Hujsak, speaking before the 17th Joint Technical Meeting of Standard Oil Co. (Ind.) and its affiliates, said that experiments conducted by Pan Am show that in-situ combustion will separate the oil from the sands and enable it to be pumped to the surface.

Those attending the meeting also were told how earth models are leading to better interpretation of seismic shock waves. The models are scaled about 1:10,000, and are made to duplicate the earth's structures. The seismic waves react the same way they do in the earth, though the model wave length is only ¼ in., compared with 200 ft. in the earth.

•

The manufacture of pipe fittings for the first time in Canada has been started by a British-backed Edmonton firm with a view toward replacing imports with "home-made" lines.

Initial production from the newly-

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OF THE
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Lone Star pipe . . like a precious jewel . . is a thing of beauty in its own field.

Its virtue lies in its flawless steel . . its artful finish by true steel craftsmen, and in the time-and-money-saving convenience of being available overnight right here in the great mid-continent oil and gas workshop.

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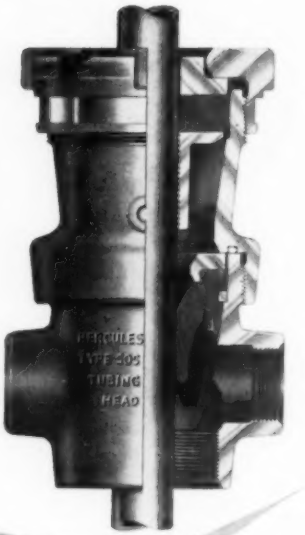
equipment to produce MORE oil at LESS cost

HERCULES TYPE SOS

TUBING HEAD

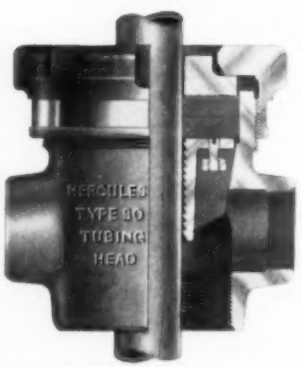
Hercules "Type SOS" is a 4000 pound test stripper tubing head. The lower section contains the neoprene tubing stripper; the upper section or bowl contains the slips and packing arrangement. The SOS is unsurpassed for use in well servicing operations in addition to its use in flowing wells.



HERCULES TYPE SO

TUBING HEAD

Hercules "Type SO" tubing head is actually the lower section of the "Type SOS" tubing head, containing the slips and packing arrangement. It is particularly suitable for pumping due to its compactness, being approximately 12 inches high.



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Export Representative Oil Field Equipment Co., Inc. 90 West Street, New York, N. Y.

opened Precision Fittings Division of Alberta Oil Tool Co. will be confined to API-gauged seamless nipples and swages, though plans call for future manufacture of additional types of fittings.

•

Engineering

A vertical gas-oil separator for use with small, low-pressure wells has been developed by V. D. Anderson Co.

Called the Hi-EF type LGV2-600, the unit has an operating range from 0 to 600 psig. pressure.

•

Drilling Highlights

North Texas—Trice Production Co. No. 1 Vera Roney, section 3321, TE&L survey, Jack County, flowed 254 b/d of 42-gravity oil through 27/64-in. choke and perforations at 4,593-610 ft. The Caddo (Pennsylvanian) discovery is 1 mi. southeast of North Wolfe field, with a failure intervening. The well also flowed 750,000 cf/d of gas from a conglomerate section at 4,946-55 ft. Dual completion will be attempted.

Wyoming—Davis Oil Co. No. 1 Federal, section 2-49n-76w, Campbell County, recovered 6,650 ft. of oil and 270 ft. of water on 75-minute drill-stem test of the Mesaverde at 6,881-920 ft. The prospect is midway in the 4-mi. gap separating Dead Horse Creek and Barber Creek fields.

Mississippi—Placid Oil Co. No. 1 U.S.A., section 22-7n-9w, Wayne County discovery for Thompson Creek field, was completed for 243 b/d of 18-gravity oil on the pump through perforations at 8,120-28 ft. The Lower Tuscaloosa discovery is 13 mi. northeast of Ovett field.

Nebraska—Signet Operating & Exploration Co. No. 1 Hill, section 25-14n-54w, Kimball County, was completed for 160 b/d on the pump through perforations at 5,786-92 ft. in the D sand. The discovery is 1½ mi. southeast of Madden field.

Northeast Louisiana—Riverside Oil Co. No. 1 Lucille Hopkins, section 33-10n-11e, Tensas Parish, was completed for 1,409,000 cf/d of gas plus 97 b/d of 59.6-gravity distillate through 12/64-in. choke and perforations at 9,012-24 ft. in the Tuscaloosa. The discovery, 1 mi. south of the 1-well Chamblee field, is a rework of a test abandoned in April, 1956, after being drilled to 9,140 ft.

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CAPACITIES: 3,000 lbs., 5,000 lbs., 6,000 lbs., 10,000 lbs., 15,000 lbs.

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Write for Bulletin No. P-85

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Export Representative Oil Field Equipment Co., Inc. 90 West Street, New York, N. Y.

test abandoned in April, 1956, after being drilled to 9,140 ft.

Starting a New Century of Progress . . .

'Best Years Still to Come'

Long-term rise in demand for petroleum is reason for optimism . . . Government controls are main threat as industry moves into 'era of efficiency.'

Over the next half-century, the petroleum industry will move step by step, without jarring dislocation, into a new era of petrochemicals, nuclear energy, and space travel. For the next ten years, the industry will be operated much as it is now—only still more efficiently.

This is the over-all prediction of 50 oil leaders as they look ahead on their industry's 100th birthday into the petroleum's second century.

Oil management today is more dollar-conscious than at any previous time, and this thinking will have great impact on the future. With worldwide crude surpluses keeping prices low and margins narrow for many years, oil-company planners are almost universally trying to reduce unit costs, to automate, to hold wage rates at reasonable levels.

And the conviction is growing stronger that the industry's public relations must improve if the tide of government controls is to be checked.

On the following 32 pages are details of the centennial forecasts of the 50 men, who are among those best qualified to speak. The highlights of what they say:

In production, the emphasis will be on secondary recovery and on bigger drilling equipment that can go deeper. There will be a parallel trend toward lighter, more mobile equipment, and a saving of labor and steel wherever possible. Stratigraphic traps will be a special target. Later on will come "breakthroughs" in oil field technology.

The smaller independent producers will find it more and more advantageous to pool their resources in order to participate in the expensive deeper drilling. A trend may develop toward "integration" of well drilling and services, allowing the operator to deal with only one contractor for all the work he needs. Higher skills will be required of oil field personnel, as automation spreads.

In processing, the trend will be toward larger, more automated refineries, and a steady increase in petrochemical output. Eventually, refinery centers will become "petrochemical complexes." For some years ahead, the gasoline octane race will still be run, but this would end with the introduction of turbine cars.

In transportation, the day of the fully automated pipeline is approaching. "Conveyor belt" operation, handling smaller batches with greater frequency, will save inventory and tankage. Fewer, smaller pumping stations also will shave costs.

In marketing, the big target will be better service at lower cost. There will be greater throughput per station, truck, and terminal. Expanded market research will support keener merchandising efforts.

In research, there will be concentration on refining more value from each barrel of crude. Hydrogen processing will get close attention, as will radiation processing and the "exotic" petrochemistry of the more distant future. More dollars will be available for research into better secondary recovery and drilling methods.

In management, oil companies will be 'optimizing' companywide operations. They will be capitalizing on the potential in operations research and electronic computers.

OIL'S FIRST CENTURY
-BORN IN FREEDOM
WORKING FOR PROGRESS

DEPENDABILITY

CAPACITIES: 3,000 lbs., 5,000 lbs., 6,000 lbs., 10,000 lbs., 15,000 lbs.

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HOME OF THE WEIGHT INDICATOR — LONG BEACH, CALIFORNIA

SPECIAL REPORT CENTENNIAL FORECAST

—Predict 50 Top Oil Men

These industry leaders make these forecasts . . .

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INDUSTRYWIDE
RATHBONE Sees Greater Success Ahead

M. J. Rathbone
President, Standard Oil Co. (N. J.)

Climbing oil demand will be an important factor . . . Oil men will have to watch costs and government controls.

THE WORLD'S NEED FOR OIL will continue to expand in the coming years—first, because the population is growing, and second, because there is a gradual rise in the degree of industrialization in many parts of the world, as well as in the standard of living. These two basic forces alone should assure that consumption of oil will become progressively higher for many years, even taking into account a substantial growth in the use of other forms of energy.

In 1959 alone, the use of oil should increase by more than 1-million b/d. Largely because of the rising trend in demand, we definitely feel we will be more successful over the next ten years than in the past ten, and that the industry generally will prosper.

The biggest problem ahead? One of the most important, which will remain for some years to come, is how to remain a low-cost operator in the face of rising expenditures and lower profits from sales.

Abroad, we will continue to face difficult problems involving the interests of foreign governments in connection with our business. We believe that faithful observance of contracts is fundamental, and that we should try to attain equitable agreements through discussion and negotiation.

At home, there appears to be a tendency for our own government to exert more and more control over business. The mandatory controls imposed on oil imports this year are but one example. Government controls, whether here or abroad, affect not just a few individuals or companies; they affect the ability of all private investment to serve people and earn a suitable reward for doing so. And too often the controls applied by government go far beyond the intended restrictions, so that consumers, employees, investors, and the general public are adversely affected.

LOUDON Sees Oil Hunger in Europe

J. H. Loudon
President, Royal Dutch Petroleum Co.,
Managing Director, Royal Dutch Shell Group

Despite the advance of nuclear energy, oil consumption in Europe should double by 1975.

FREE EUROPE WILL BE vitally dependent upon petroleum for a great many years to come. It is true that nuclear energy will be providing commercial power in many European countries by 1975. But it is a complete misconception to suppose, as is sometimes done, that atomic power has arrived in the nick of time to rescue Western Europe from dependence on oil. It still seems unlikely that nuclear power will account for more than 7% to 10% of Europe's energy supply by 1975.

The price of atomic power is determined more by capital costs than by running costs. And the capital costs

SPECIAL REPORT **CENTENNIAL FORECAST**

(continued)

of existing and prospective atomic power stations now work out roughly two to three times greater per unit of energy than the costs of conventional power stations fired by coal or oil.

It is also the case that atomic power, like hydropower, is, for the foreseeable future, primarily a method of producing electricity. Although electricity has a great diversity of application, there remain many things that need other forms of motive power. Atomic power can do little to relieve the demand for automotive fuels. Our vehicle fleets are growing at a rapid pace, and many railroads are dieselized. Our transport system, which is such a vital part of modern economic life, is very heavily reliant on oil. As we see it, the different energy sources are not competitive, but complementary.

Therefore, it must still be expected on economic grounds that the demand for oil in Europe will double or triple by 1975.

How can we be sure that sufficient supplies of oil will be forthcoming?

There is little doubt that enough oil will be available. Probably, for reasons of comparative cheapness in production costs, a substantial part of the oil will be imports from the Middle East, unless conditions deteriorate to a degree that seems to me unlikely.

But exploration work is going on in a very large number of countries in the world. Although new reserves matching those in the Middle East may not be found, we feel that important discoveries will be made that will make it possible to draw on many new sources of supply.

Furthermore, it is worth remembering that the oil-producing countries in the Middle East are very dependent on their oil revenues. They need our outlets as much as we need their oil. I cannot believe that we shall ever have to face 100% denial to us of Middle East oil, unless there is an international political cataclysm.

For these reasons I am confident that, to the extent that anything is certain in this uncertain world, oil will be in heavy demand for a long while to come—and that adequate oil supplies will be forthcoming.

Controls Threat Is Real, Says WHITEFORD

Political dangers are greatest facing oil . . . Big industry needs are for cheaper production, better communications.

THE LARGEST STUMBLING BLOCK to success in oil operations is posed by various kinds of governmental schemes that seem to be aimed at making every oil company a ward of Washington. It would seem that the oil industry's biggest problems are not business problems at all, but political ones.

The question of whether there will be more or less government control 25 years from now depends on what the industry does now. If segments of the industry continue to besiege Washington for mandatory control of operations that should be left in the realm of normal competitive activity, then it is quite obvious that the growth of controls will be stimulated. Oil men should realize that freedom is not divisible, and that once they have opened the door to government management of any segment of the industry, they must expect a continuous and expanding effort by government to control the whole industry.

Unquestionably the most fertile field for improvement, in terms of invention and new equipment, lies in the areas of production, particularly in the U.S. For more than a decade we have watched a steady rise in the costs of finding and producing oil. This is partly due to inflation and partly to the necessity for more wells, deeper wells, and offshore exploration (which has not yet justified the enormous capital sums invested in it). Innovations that would reduce exploration, drilling, and recovery costs would seem to be the most needed improvements.

In employee relations, there is a very definite need for management somehow to give employees a closer personal identification with the problems, successes, and failures of the company for which they work.

W. K. Whiteford
President, Gulf Oil Corp.

From the standpoint of human relations, it makes little difference whether you talk to people by letter, radio, or other means. What is needed is a betterment of communications between management and employees, bearing in mind that anything less than two-way communication is virtually no communication at all.

We at Gulf do not foresee any substantial change in operating policies during the next five to ten years. Over the past three years, we have practically completed a general reorganization that was deliberately planned for the future. This reorganization was designed to overcome areas of operational imbalance, and to establish that degree of sensitivity to changing conditions necessary to keep the company's operations on a constantly expanding plane.

continued ▸

STEINIGER—Oil Use Up 4% a Year

E. L. Steiniger
President, Sinclair Oil Corp.

Technological gains will help meet demand... Roadblocks are financing and government interference.

WITH A SIGNIFICANT INCREASE in population, an increase in suburban homes, and the need for more transportation and heating, U.S. consumption of oil products over the next ten years should show a consistent increase. The average gain (compounded) should be about 4% annually.

There will be improvement in refining equipment to provide new and better products for the higher-compression, higher-speed, and higher-operating-temperature equipment that is projected. Automation in the oil fields and in transportation will help offset increasing costs. New drilling equipment will increase the rate of penetration, reduce the number of trips into the hole, and insure better well completions.

Our greatest problems over the next ten years will be: (1) to obtain realistic depreciation deductions to provide for the replacement of old, low-cost equipment and raw-material reserves, (2) to generate, or otherwise finance, an ever-expanding investment in plant, (3) to avoid inflation, (4) to work out reasonable regulations with the government—such as those regarding imports of raw materials—to permit a balanced, equitable operation free of controls, and (5) to train adequate executive personnel.

The problem of government restrictions is long-term. It appears quite certain that we shall become increasingly dependent upon foreign sources for a continually greater part of our crude requirements. We can expect a corresponding increase in government checking—if not control—to assure the uninterrupted availability of foreign supply for our national security and economy.

Any use of atomic blasts by the industry would involve government control to some extent.

We also look for continued regulation of natural gas, and attempts to regulate pipelines and marketing—all requiring a constant review of operations by governmental bodies. Increasing gasoline and diesel fuel taxes will also be a problem.

There will always be a need for efficient, well-managed, small and medium-sized companies, and enterprising independent operators, in all branches of the industry. However, there appears to be a tendency toward larger, integrated companies, primarily to meet the ever-increasing investment required to explore for, produce, refine, and market oil economically. Such companies have the added security of diversification as a cushion against the severe adverse conditions that may arise in a single segment.

There will be a great upsurge in the petrochemical part of the oil industry. In the far-distant future, we will have primarily a chemical industry, rather than a petroleum industry. This will be true once we have arrived at the point where, say, 75% of our energy is being supplied by atomic, celestial, or other sources. At that time the energy might be distributed to moving units by wireless.

Personnel relations should improve. We believe employees will take a greater interest in the many problems, particularly political.

(continued)

Watch Out for Wage Spiral—SUPPLEE

Union pressure for 'more' disrupts economy . . . Management must reach everyone with the facts.

ONE OF THE MOST SERIOUS problems that will confront not only the oil industry but the whole economy in the years ahead will be that of rising costs from wage increases that outstrip productivity. On top of this, oil labor leaders are predicting such long-term fringe benefits as paid vacations of four to six weeks, full medical and hospitalization coverage, and guaranteed payment of expenses for four years of college for workers' children.

Increases in money wages that exceed increases in the output of goods can result only in higher prices. Workers receive no real benefit from such raises, and they create serious injustice and imbalance among the many groups who do not share in them.

The solution in the years ahead will have to be found in a greater understanding of the economic facts of life by oil workers, their bargaining representatives, legislators, and the public at large. And there must be better communication among oil companies regarding plans for wage negotiations to counteract the oil unions' divide-and-conquer techniques. This does not require industrywide bargaining, but it does mean that oil management can avoid an industrywide "blindman's buff."

Henderson Supplee, Jr.
President, Atlantic Refining Co.

McCOLLUM Predicts Better Tools

L. F. McCollum
President, Continental Oil Co.

New equipment will lower cost of finding oil . . . But financing won't be easy for independents.

WITHIN THE NEXT five or ten years, there should be many innovations in oil field equipment. Among those it might be reasonable to expect:

(1) More thorough utilization of seismic and subsurface data in the search for stratigraphic traps.

(2) Further use of data processing, and electronic analysis of geophysical and geological data.

(3) Improvements in, and greater use of, energy initiation methods, such as the "thumper."

(4) Improvement in photographic processes for preliminary evaluation of remote areas.

(5) A method for more accurately dating strata.

(6) Improvement in well-logging devices for more positive identification of rocks and fluids.

(7) Improved tubular goods, which will not have to be replaced during the life of a well.

(8) Offshore drilling from floating drilling equipment in water depths of 600 ft. or more.

(9) Methods of increasing the speed of drilling.

The major business problem confronting the petroleum

continued ▸

industry during the next decade stems from the persistent rise in the cost of finding and developing domestic reserves. Since the end of 1952, the costs of labor, materials, and services in our industry have been spiraling upward. On the other hand, there have been only modest advances in product prices.

The cost-price squeeze has been accentuated by an overabundant supply of crude in the Free World markets. Since 1952, major crude discoveries in the Middle East, North Africa, and Latin America have more than doubled the ratio of reserves to production outside the Iron Curtain. As a result, the Free World now has greater availability of crude in relation to demand than at any time in the past 30 years.

For several years, the Free World markets will be characterized by an abundance of crude supplies in relation to demand—even under exceedingly optimistic assumptions regarding growth in demand, and conservative assumptions regarding future crude oil discoveries. As long as this excess supply continues to exist, the domestic industry will have trouble recovering cost increases through higher prices for crude or products.

There may well be a trend over the next 25 years to fewer but larger producing companies. The capital investment required to enter the industry and to remain competitive will gradually increase, as reserves become more difficult and costly to find. Thus, fewer new companies may be formed, and some small companies may elect, or be forced, to drop out.

The return on investment realized by the domestic producing industry has declined sharply over the past decade, as a result of increased costs and inadequate price increases. Consequently, the industry is becoming less and less attractive for the investment of capital funds. The inevitable result, barring a reversal of this trend, is that many companies will find it desirable to liquidate, or invest their funds in other than producing activities.

The trend toward government intervention in the oil industry will continue during the next quarter-century, because one sees no real dissipation of the forces causing it. Segments within the industry itself have failed, and continue to fail, to recognize the dangers of government control of industry affairs. They have at times invited such control. Our efforts should be redoubled to reverse the current trend, which is in the best interests of neither the industry nor the nation.

BULLARD Says Cost-Trimming Is Vital

Automation, plus new oil-finding techniques, will boost efficiency . . . So will more field authority.

E. F. Bullard
Chairman of the Board, Pan American Petroleum Corp.

THE BIGGEST PROBLEM over the next decade will be to hold down costs in order to compete successfully. There seems to be no end in sight to the continuing inflationary spiral that increases costs and the prices of the goods and services we must buy. Finding ways to operate more efficiently—and thus to do a greater volume of work without substantial increases in cash outlays—poses the major problem for management. If that can be solved, technical problems will take care of themselves. That it must be solved is evident, if we are to head off consumer price resistance at home, and at the same time become more nearly competitive with lower-cost foreign production.

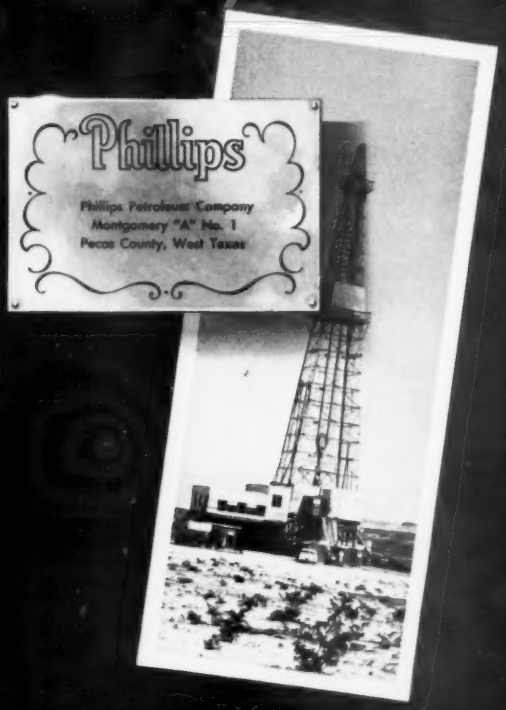
We anticipate that wider use of automatic equipment will be made throughout our field operations, as a means of holding the line against rising costs. At Pan American, we now have installed, or on order, lease automatic custody transfer equipment to handle well over 20% of the crude we are producing. This percentage will unquestionably increase to the point where, within ten years, virtually all of our production will be automatically handled.

We expect an improved drilling technique that will permit faster drilling, deeper drilling, and at the same time lower-cost drilling. We also expect improvements in seismology and other geophysical tools, as well as in geological techniques and interpretations, that will assist in locating stratigraphic traps, a major remaining source of oil in the U.S.

In our own company, we plan increasing emphasis

continued ▶

23,400′



25,340′

THE WORLD'S DEEPEST WELLS –

Forever Recorded in Petroleum History – Logged and Perforated by Schlumberger

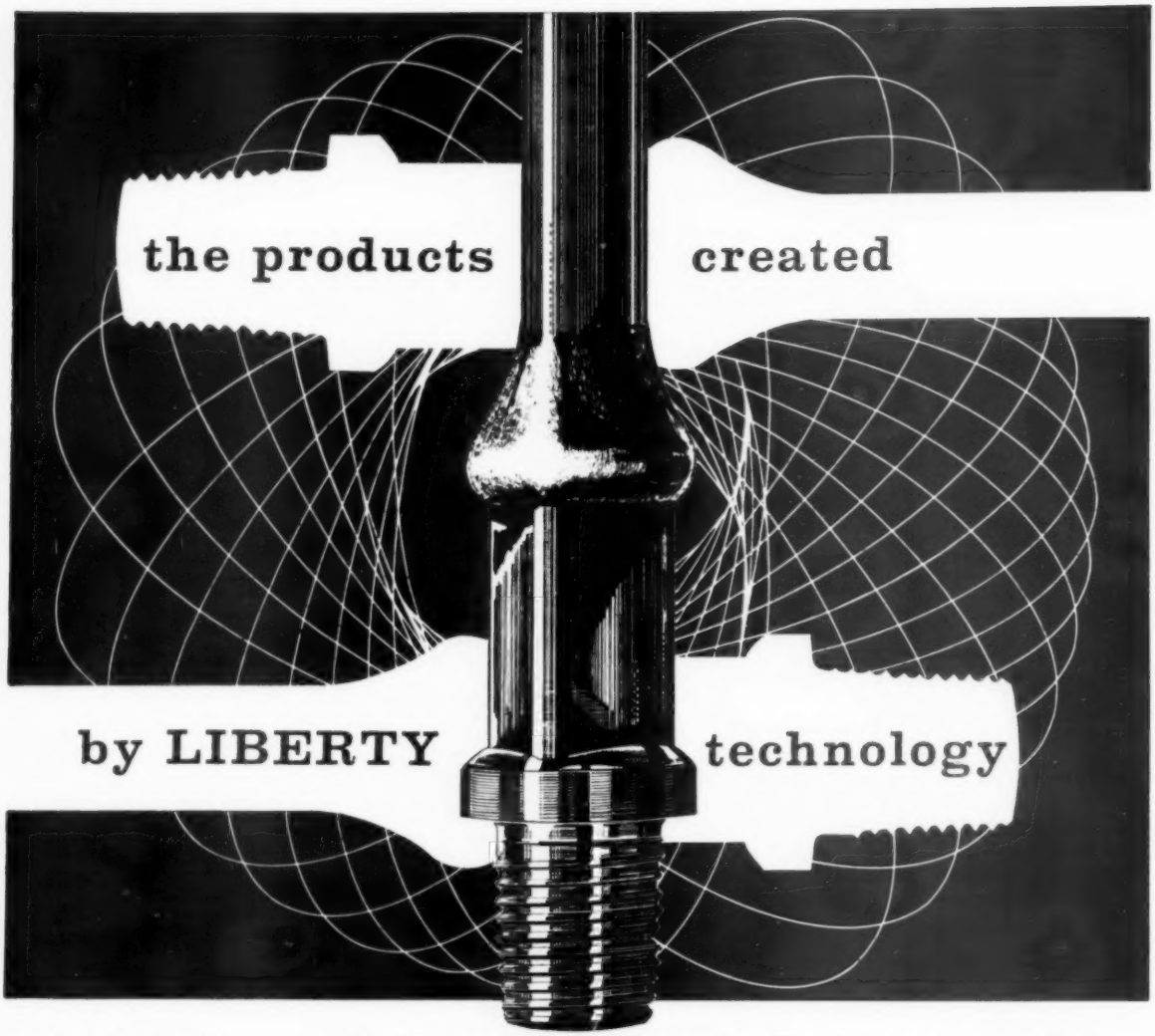
Schlumberger is proud to have been called for both logging and perforating the World's Deepest Well, the Phillips Petroleum Company, No. 1 University "EE." Record-breaking, open-hole logs included the Electrical Log, Microlog, Gamma Ray-Neutron Log, and Dipmeter Survey. In the deepest perforating operation ever performed, Schlumberger made 24 successful shaped-charge runs out of 25—firing 1420 shots from 24,967 feet to 25,322 feet. Bottom-hole temperature: 360°F. Bottom-hole pressure: approximately 15,000 pounds.

These operations followed Schlumberger's successful logging and perforating of the previous record-depth well, the Phillips Petroleum Company, Montgomery "A" No. 1 in the same area. The Montgomery "A" No. 1 was drilled to 23,400 feet.

The confidence of the industry in the ability of Schlumberger to meet advancing requirements is shown by the fact that Schlumberger has logged every record-depth well since 1934.

THE EYES OF THE OIL INDUSTRY

SCHLUMBERGER



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LM-5

on overseas exploration and production. At the same time, we will maintain a strong domestic program—domestic meaning North America—since we believe that domestic production will continue to be the backbone of U.S. petroleum supplies. Growing world markets outside the U.S., however, make it desirable to seek out crude supplies in foreign countries. We are well embarked on this program, and we think it will be an increasingly important aspect of our business over the next five to ten years.

Since 1948, Pan American has gradually been delegating greater authority and responsibility to the division, district, and field offices of the company. Today, the divisions are basically responsible for the conduct of all actual operations. We contemplate that, over the next few years, the divisions will be made even more autonomous, and that the responsibilities of the district managements, in particular, will be further strengthened.

As for government control, the trend is in the direction of greater control, both at the state and federal levels. We do not foresee either complete socialization, in the form of nationalization of the industry, or a return to the more desirable regulation-free society. We do foresee a situation somewhere in between these two extremes, one in which government will take upon itself more of a firm hand in determining fuel policies.

Despite such problems, we feel we will be more successful in the years ahead. U.S. demand for oil products will continue to grow, to the point where the country will be using 15.3-million b/d in 1970, as compared with about 9.5-million b/d this year. Demand will have an even greater rate of increase in areas outside the U.S. These demand increases should begin to take up the slack of excess capacity that exists in the world—including the U.S.—thus easing the financial burden of carrying this capacity, and, at the same time, improving our financial position generally.

SEGER Sees Era of Efficiency

J. L. Seger
Executive Vice President, Carter Oil Co.

Careful cost-trimming will be needed, with cash harder to come by... Better management methods will be stressed.

ALTHOUGH THERE PROBABLY will be no radical changes in oil operations and policies in the near future, the trend is clearly toward more emphasis on efficiency and cost reduction, including a shift to automation where applicable.

Increased effort in research will improve methods. More attention will be given to short and long-range planning.

The probable boom in demand for energy in the middle 1960s may be a problem, for the industry may not fully anticipate the sharply increased demand.

The domestic industry's most serious problem is that of replacing its crude reserves under conditions of sharply rising costs; this must be done in a manner which will permit it to sell products at reasonable prices and realize a fair return.

The oil industry has had high cash requirements for a long time, and this will continue. Historically, the industry has generated most of its cash requirements. But this is becoming progressively harder. Since finding oil is a high-risk business, borrowing for exploration is somewhat difficult. The future cash requirements of the industry probably will be a major problem.

As a result of increased emphasis in certain gas-producing areas, gas will become a more important part of our own company's operations in the future.

Secondary recovery will play a larger part in our producing picture. At present, one-third of our production can be credited to waterfloods. We expect new methods developed in the next ten years to bring considerably greater efficiency to secondary recovery.

Significant advances are ahead in drilling equipment and completion techniques. The tubingless completion is becoming more common. But full advantage of this technique cannot be taken until there is an adequate number of properly sized drilling rigs available.

Over the next decade, our company should be more successful in exploration than in the past. Our fund of information has grown substantially. We have a larger number of technical exploration people than before.

The rapid expansion of the oil industry has made the demand for management personnel a real problem. The need for better communications with employees will require top executives to spend more time in informal and formal appearances, both within and without their companies. And the need to develop better managers will result in more time spent on evaluating and counseling.

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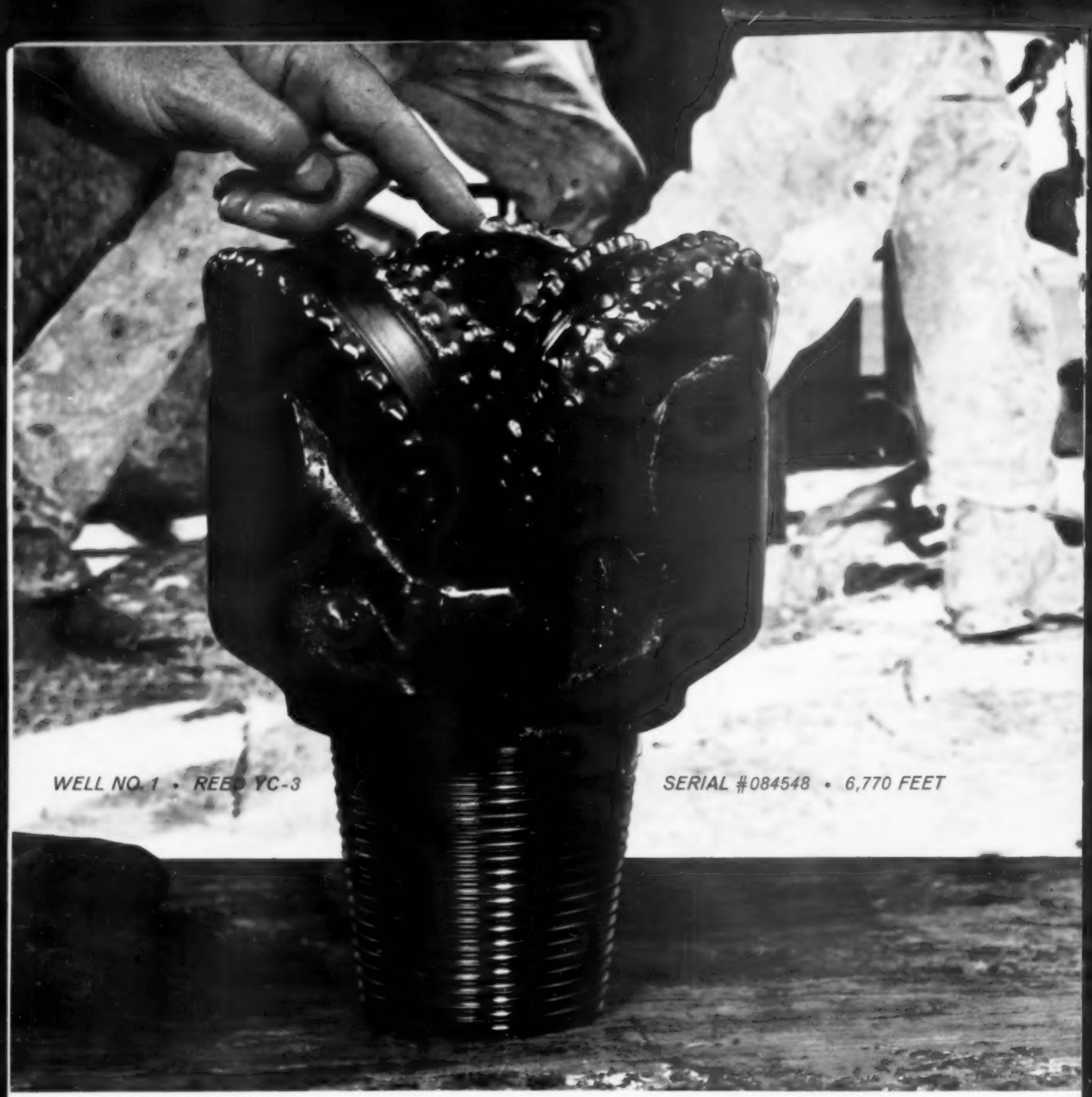

TWO BITS... TWO WELLS... TO

These two Reed Cobra bits *each* completed the entire 8¾" portion of a hole—from surface hole to bottom. One bit cut 6,770 feet in 152 hours. The other cut 6,268 feet in 98 hours.

Spectacular runs by Reed Cobra bits are becoming commonplace. Have you tried them lately, all the way? Your Reed representative will be glad to give you the whole story on these bits—and the complete line of Reed products.

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COMPLETION – 13,038 FEET

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REED'S ROLLIN'

REED Y BITS

(continued)

Intensified Problems Ahead—SPAHR

Three big obstacles to oil progress: government interference, labor demands, and the test of management development.

C. E. Spahr
President, Standard Oil Co. (Ohio)

THE YEARS AHEAD will be ones of continued and uninterrupted growth in petroleum demand. They will see an expanded search for sources of crude oil outside the U.S. and an increased dependence of the U.S. refiner on these foreign sources. There will be greater diversification of the petroleum industry through the increase of its petrochemical activities.

The success of the industry, and of individual companies within the industry, will depend on the ability of corporate organizations to meet the growth efficiently, to succeed in the search for oil, and to apply the skills of existing research organizations to the growing petrochemical phase of oil industry operations.

Three problems already with us can be expected to grow in magnitude. First, the government is showing increased concern with the operations of the oil industry, in spite of the fact that the industry has a long and successful record of meeting the requirements of its consumers and of the country. This trend on the part of the government can be reversed only if individual members of the oil industry can learn to tell their story more effectively. More individuals must tell their representatives in the various legislative bodies that further restrictive legislation will lessen the effectiveness with which the industry can meet the demands of consumers of petroleum products.

Second, there has been a tendency on the part of some segments of organized labor in the oil industry to demand and get wage increases that have a value in excess of the productivity increases that the industry has experienced. Competition can, under these circumstances, result in the delay of price increases for the short term. But over the long term, these wage increases build an inflationary factor into petroleum prices that is unhealthy both for the industry and for the strength of the national economy.

The third major problem presented by growth is the need for increasing numbers of imaginative and resourceful managers. In this case, the companies of the oil industry must look to their own organizations. They must utilize and develop all of the talents their employees have. In addition, companies within the oil industry must offer financial assistance to the educational institutions from which the raw material of their future managers will come.

O'HARA—Oil Price Control Coming?

Donald C. O'Hara
Assistant General Counsel, National Petroleum Assn.

Mandatory oil imports make it possible.

UNDER THE MANDATORY imports control program, the federal government is in a position to regulate about 10% of our total petroleum supply. The government agency charged with administering the program has been directed by the President to take the price of petroleum products into consideration as a factor in determining the proper level for imports. Thus, a government agency has been given a regulatory power over prices that, in many ways, is greater than was wielded during World War II. The control of supply provides a simpler and more effective way of dealing with prices than the prosecution of individual offenders.

There is going to be plenty of pressure on the government to use this power for political purposes.

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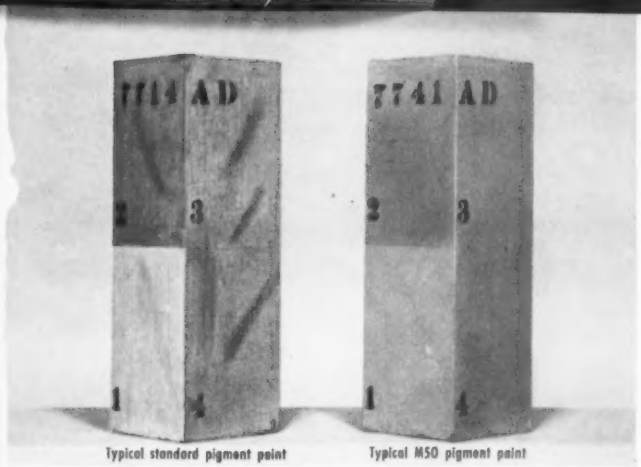
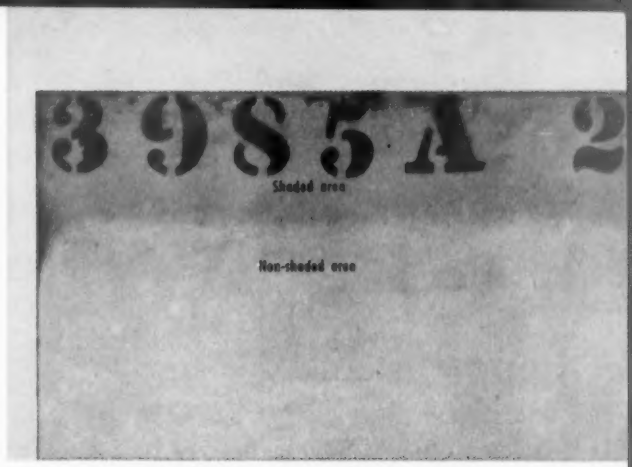


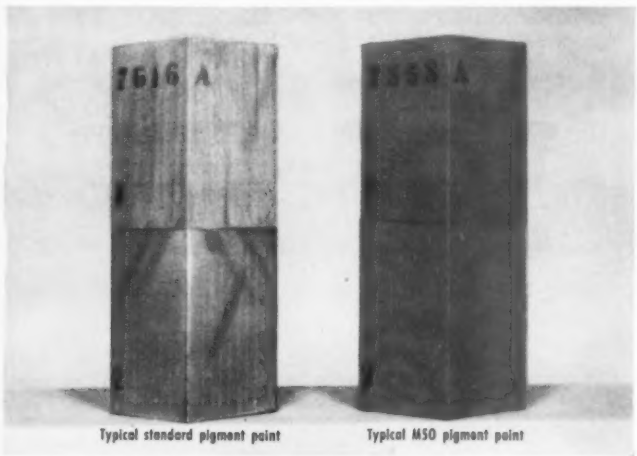
No objectionable whitening from chalking

Contrast these two exposure test panels . . . both show comparable metal finish paints. Same original colors. Same exposure (45° South, 2 yrs., 3 mos.). Notice bright color of *M50* paint, freedom from chalk.



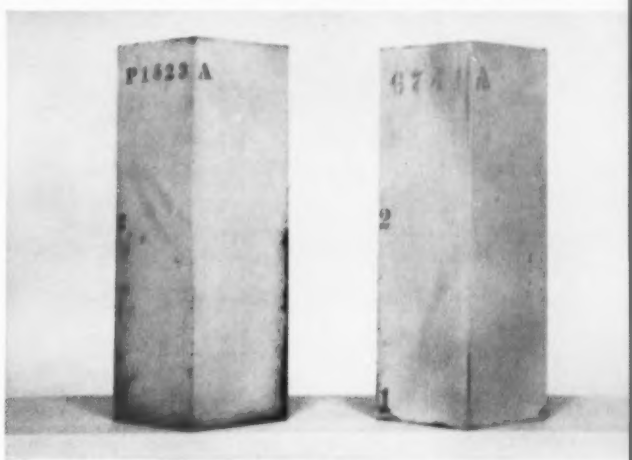
No appreciable fading from light action

Now look at this 9-year exposure test panel of an *M50* paint. Contrast area shaded by wooden panel holder with non-shaded area. Clearly, there has been practically no fading in this 9-year period.



No leaching from water action

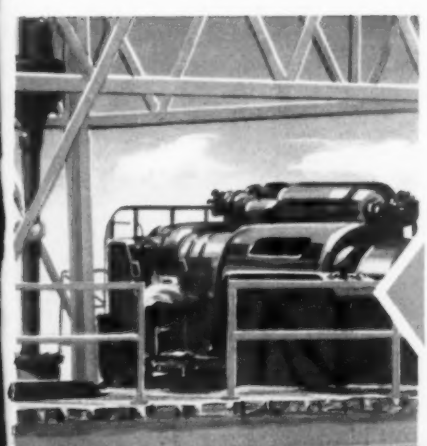
Examine the exposure panel at left. Notice the vertical brushmarks? Rain water leaching of the top coat permits brushmarks in undercoat to show through. In the panel at right, insoluble *M50* pigment prevents this film failure. Exposure 45° South, 2 yrs., 7 mos.



No discoloration in industrial atmosphere

Here are two exposure panels painted from the same can of *M50* paint. Both have been exposed 4 years, 45° South. The right one in normal atmosphere, the other in sulfur-laden industrial atmosphere. Notice no color difference has developed. No bilging.

Proof you get unique color stability in metal protective paints made with M50® pigment

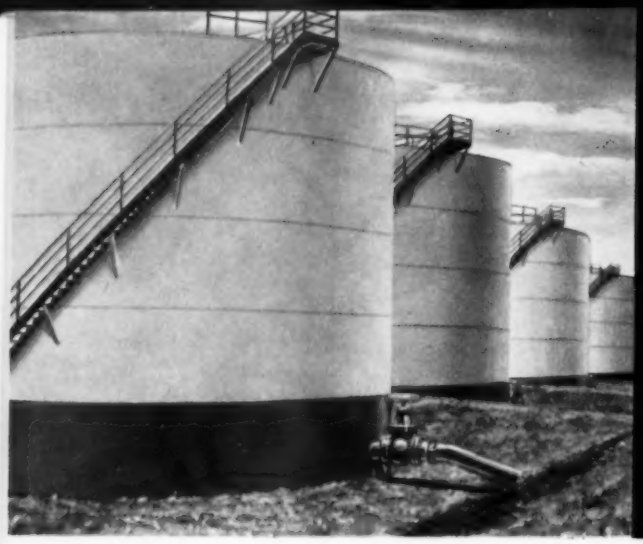


Drilling equipment looks better, needs less maintenance painting when painted with colorful *M50* anti-corrosion paints.

No need to amplify what the four illustrations above show. Plainly, *M50* basic lead silico chromate pigment permits your paint supplier to make paints with more color stability than ever before available in anti-corrosion paints . . . primers as well as finishes.

National Lead exposure tests demonstrate that these paints . . . both standard and heavy coat . . . also provide better and longer lasting anti-corrosion action, and never-before weather resistance. Some of the opportunities these new *M50* paints present are suggested on the following page. You'll think of others.

M50 pigment is a product of **National Lead Company**



Public relations.
Attractive tank farms that *stay* attractive longer.

Product identification.
Color-coded drums that *stay* colorful longer.

Two ways to make good use of the superior color stability of M50 pigment anti-corrosion paints

Before the advent of *M50* pigment, those responsible for maintenance painting had to make a choice between colorful appearance and long-lasting corrosion protection.

With *M50* pigment paints, exposure experience proves, this compromise is no longer necessary. *M50* paints have weather resistance . . . stay bright and colorful . . . and *at the same time* provide superior corrosion protection. With these unusual paints, color stability problems . . . leaching, fading, whitening, darkening from bilging . . . are eliminated. Now, with *M50* paints, you can have maximum anti-corrosion, maximum durability and, at the same time, long-lasting good appearance.

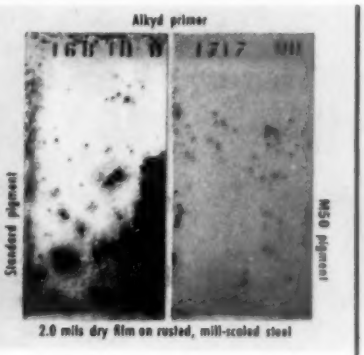
The illustrations above suggest two areas in which the combination of superior anti-corrosion action and superior color stability found in *M50* pigment paints can pay off handsomely. Note that in both, service is severe and colorful colors are needed. With *M50* paints, you repaint less often.

In your own operations there are bound to be many similar applications where specification of *M50* paints can lower your maintenance painting costs. Ask your regular paint supplier to make up suitable *M50* paints for your requirements.

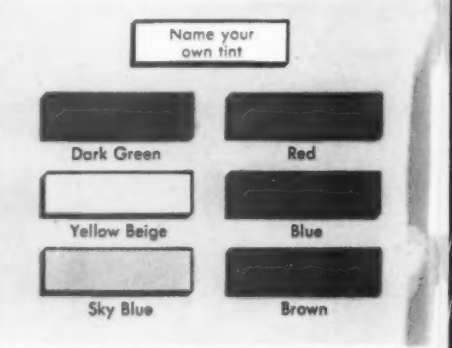
Why M50 Defense in Depth paints give anti-corrosion beyond all former concepts

1 standard pigment alkyd primer coat
2 standard pigment alkyd primer coats
Gray Alkyd Finish Coat
2 M50 pigment alkyd primer coats
1 M50 pigment alkyd primer coat

Exposed 9 years, 45°S. Each coat 1.5 mils
Proved corrosion and weather resistance



Exposed 45 S, 1 yr ind. atmos, 1 yr normal atmos
Proved outstanding for film strength, durability



Colors above available in conventional and heavy-coat paints
A wide range of stable colors can be produced

Are you concerned with tank or structure maintenance painting in your firm? If so, you are invited: (1) to visit National Lead's Sayville, L.I. test station, where you will see the results of the 20 years research that lies behind the *M50* pigment particle and the more than 10 years of exposure testing that lies behind *M50* pigment Defense in Depth paints; (2) to send coupon below for National Lead booklet, "Defense in Depth" and typical *M50* tank paint specifications.

Next time you purchase, specify *M50* pigment paints. Any paint manufacturer can supply you.

M50 Defense in Depth

National Lead Company,
111 Broadway, New York 6, N. Y.

Gentlemen: Please send me the "Defense in Depth" booklet together with typical tank paint formulas and color chips that I can use in specifying M50-type tank paints.

Name_____ Title_____

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City_____ State_____

(continued)

Better Machines Will Be Coming—MONTGOMERY

With the trend to automation will come closer attention to employee relations.

OVER THE YEARS AHEAD, there will be a more pronounced shift toward petrochemical manufacture, and an increase in the number of catalytic processes to upgrade residual stocks. To an increasing degree, we can expect to see larger process units, employing automatic controls. Processes that are not now known will undoubtedly be used for manufacturing petroleum products.

The use of labor-saving devices, particularly by maintenance and office forces, will increase. Communications will play an increasingly important role. Operations will be more closely integrated by means of teletype, telephone, radio, television, and air transportation. The development of electronic office equipment will be an important factor in this trend.

Attention to employee relations will continue to require increasing attention on the part of oil executives. The cost of labor will be one of our biggest problems in the next decade, particularly in the face of constant union demands. To the extent that costs are not excessive and profits are sufficient, we foresee continued liberalization of employee benefit plans.

Human relations within the industry will continue to improve as jobs require more initiative in their performance, and as individuals take more pride in carrying out more demanding duties.

S. A. Montgomery
Vice President, Manufacturing, Standard Oil Co. (Ind.)

SHAFFER Says Unit Costs Must Dip

K. H. Shaffer
President, Standard Oil Co. of Texas

Cheaper drilling is the big need . . . Oil must also fight controls, and good communications with employees will help.

THE TREND TOWARD MORE EFFICIENCY and automation is growing stronger by the year. We will have to produce a product for relatively less because of continuously rising costs. What we need most is equipment that will provide us with a less expensive way of drilling wells. This will be essential as we approach the day of the 50,000-ft. hole, which I am confident will come.

The biggest business problem that will face us will be government controls, which slow down business and make operations less effective. Examples are the Federal Power Commission controls on gas and the many other legislative proposals constantly being presented to divorce various phases of the oil industry. Unfortunately, there probably will be more control of the industry in the years ahead.

The need for better communications with employees is a challenge management must meet. We must let employees, as well as the public, know the reasons for our actions. This means that individual managers will take more of their personal time to explain what the company is doing, and why.

Many of the important oil companies will continue to grow in size. But there will still be room for small firms in the future, and their number should increase.

Over the coming century, new types of power will become available. However, there will continue to be a need for widespread sales points, and these will probably offer the other types, in addition to oil.

continued ▶

SPECIAL REPORT **CENTENNIAL FORECAST**

(continued)

ECONOMICS

Oil Climbs with Population—PETERSEN

In U.S. and abroad, the petroleum industry will meet demand gains of 50% to 300% by 1975.

FUNDAMENTALLY, markets for petroleum products are made by people. On this basis, we can be reasonably certain of continuing market growth. United States population is expected to grow by 33% by 1975, to 227-million people. Outside the U.S. in the Western Hemisphere, we anticipate an increase of 50%, to 291-million. The free areas of the Eastern Hemisphere should boom up by about 31%, to 1.2-billion. Even Europe, which will probably have a relatively modest growth, is expected to go up in population by 12%, to about 352-million.

All of this translates into definite requirements for greater and greater quantities of energy. It is forecast that by 1975 the Free World's total energy needs will reach a staggering figure of 75-million b/d in oil equivalents. Of this total, 50% will be met by petroleum, which will be both an absolute and a relative gain for oil.

It is estimated that gasoline consumption will double by 1975 in the U.S., and triple in other Free World areas. Declining use of aviation gasoline will be more than offset by increased consumption of jet fuel. Motor gasoline and jet fuel demand will exceed 50% of total domestic demand for petroleum products.

Demand for distillates in the United States is expected to increase by 47% by 1975, and to triple elsewhere in the Free World. Distillates in the U.S. will encounter increased competition from natural gas. This is not the case in Europe, however, where low-cost natural gas is not so readily available, at least as of the present date.

T. S. Petersen
President, Standard Oil Co. of California

Shifting Gears Vital, Says WARNING

U.S. is no longer the world oil center . . . Demand outlook bright.

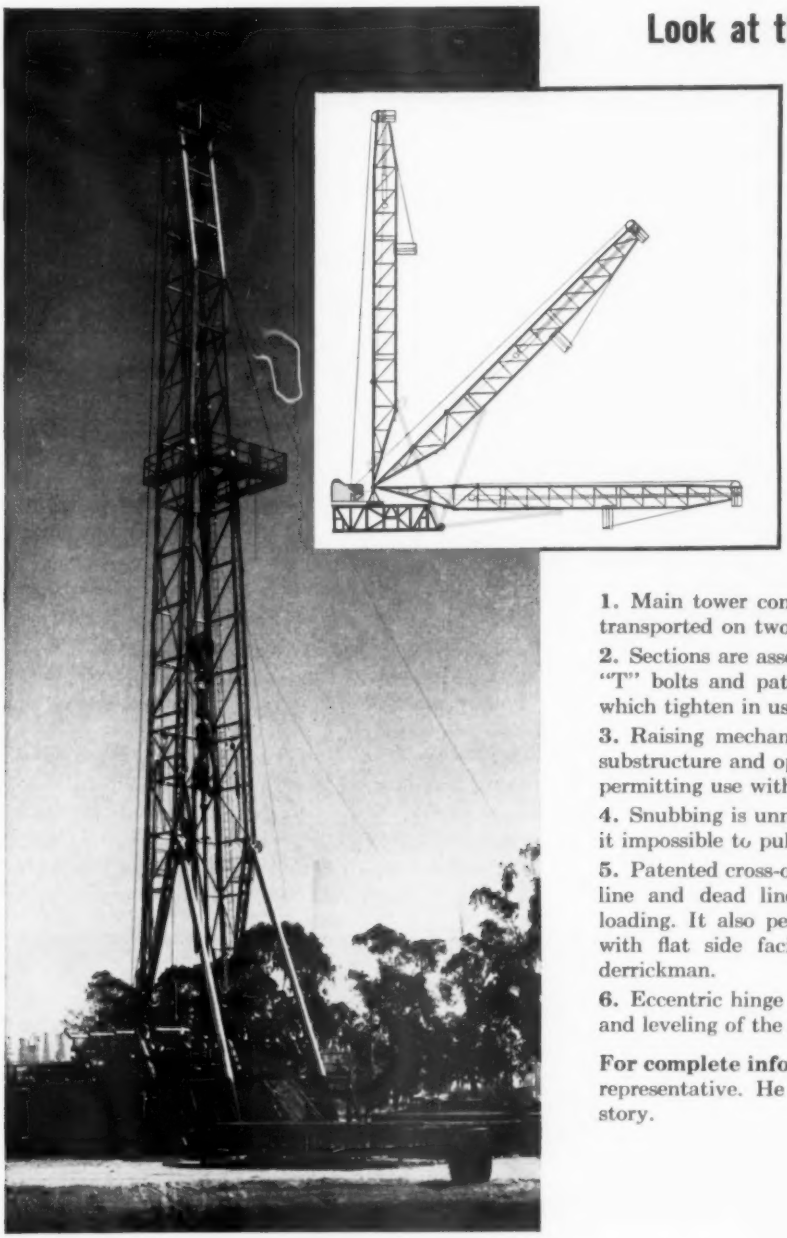
THE ECONOMY OF THE U.S. and of the world is changing very rapidly, and the oil companies must change with it. This is not always easy, because there are always elements within a company or an industry that are resistant to change. Very often, this resistance takes on political overtones, so that the oil companies' problems become political or legal—and at times on an international scale—rather than merely economic. Nevertheless, the two aspects of such problems are inseparable. The general problem of adjusting to changing economic conditions, including any internal or political friction that may develop, is one of the industry's biggest problems.

The balance of world oil supply has already shifted

continued ▸

Donald S. Warning
Manager of Distribution Economics, Supply & Transportation Dept.
Standard Oil Co. (Ind.)

PUSH . . . not pull . . . raises this all-new "Oilwell" Lever-Lift Mast!



Look at this schematic drawing!

See how the lifting power from the draw works is first applied through the wire line system at a point near the center of the mast while in horizontal position . . .

. . . and how this power, using leverage principles, pushes against the front legs until the mast reaches an upright drilling position—approximately one degree from vertical.

The lifting levers then lock into place with an automatic wedge-type mechanism and become the front legs of the mast—an integral part of the unit.

. . . and note these design features

1. Main tower consists of five sections which may be transported on two semi-trailers and one truckload.
2. Sections are assembled at ground level by means of "T" bolts and patented built-in wedge-lock fasteners which tighten in use.
3. Raising mechanism is on the forward part of the substructure and operates in front of the hinge points, permitting use with any make draw works.
4. Snubbing is unnecessary. An overtravel stop makes it impossible to pull this mast over backwards.
5. Patented cross-over crown block assembly, with fast line and dead line outside the mast, equalizes leg loading. It also permits stringing the traveling block with flat side facing and fast line away from the derrickman.
6. Eccentric hinge pins in each leg facilitate centering and leveling of the crown block.

For complete information . . . contact your "Oilwell" representative. He will be glad to give you the full story.

USS and "Oilwell" are registered trademarks

Oil Well Supply Division of USS United States Steel

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HOW TO MAKE EXTRA PROFIT WHEN USING BARITE RECOVERY MACHINES

You will be money ahead if you answer these important questions before using any barite recovery machine

How Is Barite Lost?

Most Barite is lost when the tanks are jetted to remove excess solids in the form of fine drilled clays. *If this jetting were not necessary, there would be little need for a barite recovery machine.* When you jet your tanks to get rid of unwanted clays, you also jet out large quantities of valuable barite. The problem is to *selectively* discard unwanted clays and retain costly barites, while processing a minimum volume of mud.

So What Should A Machine Do?

The first and most important requirement is *to reject drilled clays.* Next in importance is the barite recovery efficiency. Virtually no chemicals used in drilling muds can be separated from drilled clays with practical equipment. For that reason, the higher the clay rejection efficiency, the less mud need be processed. As a result, *chemical and barite losses are held to a minimum.*

High clay rejection efficiency is an important reason why the *Clayjector®* is preferred by so many operators. As a matter of fact, it was named Clayjector to dramatize the importance of clay rejection.

What Are Some Other Requirements?

During mud maintenance, the high clay rejection and barite recovery efficiencies shown in the table below are of great importance. Together they result in less barite lost for each pound of clay removed.

Where reserve pits contain important quantities of barite, the Clayjector is outstanding. It has a much higher capacity than other type machines and it delivers *almost completely pure barite. This is an important advantage when very heavy muds are used,* since the clay content of these muds must be closely controlled.

Because of unusually low rental costs, the Clayjector has been proved profitable when as few as 60 sacks of barite per day are required for mud maintenance.

The Clayjector is simple and easy to operate. It is easy to move and it is flexible in operation. All barite is returned as a smooth slurry that is easy to mix. The unit results in faster drilling and greater safety from lost circulation or blowouts because closer control of mud is possible.

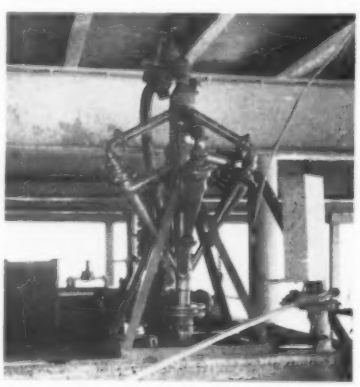
Get the whole story from your SWACO representative or write us direct. If you have been using other barite recovery machines, you will be surprised at the added savings you can make. If you are not using a barite machine, and are using weighted mud of over 11.5 pounds per gallon, you probably can save money by installing a Clayjector.

®Clayjector is trademark of Dorr Oliver, Inc., Stamford, Conn.

FIELD PERFORMANCE DATA ON CLAYJECTORS

	Stream	Weight #/gal	Flow gpm	Bar. Rec. %	% Clay Rejec.
Offshore, La. 15.1 #/gal mud 1 Clone S.G. Bar = 4.18 10/22/58	u.f. o.f.	17.3 8.9	3.3 21.4	95.1	71.1
Offshore, La. 14.8 #/gal mud 2 Clones S.G. Bar = 4.17 11/1/58	u.f. o.f.	17.1 8.9	6.8 40.0	89.7	73.0
Offshore, La. 13.6 #/gal mud 1 Clone S.G. Bar = 4.19 about 11/25/57	u.f. o.f.	16.0 8.8	3.8 21.4	93.8	73.7

U.F. = Underflow — Barite slurry returned to mud system.
O.F. = Overflow — Light solids and fluids to waste.
These results were calculated by an independent testing laboratory from samples taken at the rig.



SWACO

SALT WATER CONTROL Inc.

1809 Continental National Bank Bldg. Phone: ED 2-4434 Ft. Worth 2, Texas

away from the U.S., and without a doubt that shift is permanent. The balance may still be thought to lie in the Western Hemisphere, but that probably will be short-lived. Most likely, the balance will shift increasingly toward the Middle East in the next decade. But the search for oil is now truly worldwide, and as a result Africa, Asia, and countries in the Soviet orbit will increase in importance as supply sources. This will tend to distribute supply rather evenly around the world and beg the question of "the balance of world oil supply."

In the U.S., kerosine, distillates, and residual will decline as a proportion of total oil industry volume. Jet fuel, asphalt, liquefied petroleum gas, coke, and some specialty products will increase their proportions. Gasoline's share of the volume will remain about the same, but its share of the sales dollar will rise.

The over-all U.S. supply-demand outlook is favorable (figures in 1,000 b/d):

	1959	1960	1961	1962	1963
Domestic demand	9,450	9,752	10,084	10,377	10,672
Total demand	9,715	10,007	10,329	10,612	10,897
Domestic production	7,235	7,447	7,639	7,792	7,947
Imports	2,500	2,610	2,740	2,870	3,000
Total new supply	9,735	10,057	10,379	10,662	10,947

Petrochemicals will continue to grow, though not at so high a rate as in the past.

Crude, Crude, Everywhere—LUTZ

Foreign surpluses will heat competition . . . Product shifts in the U.S. will be slight.

EXCESSIVE SUPPLIES OF CRUDE will perhaps be the major problem of world oil over the next ten years. We anticipate that by 1965, Free World production capacity will be in the neighborhood of 5-million b/d in excess of demand. Furthermore, the control of this production will be divided among a large number of competing countries, as well as among a large number of competing oil companies.

The problem will be aggravated by a continuing tanker oversupply which may well be worsened by the nationalistic aspirations of producing countries that feel they should become active in refining, transportation, and marketing. The resulting low tanker rates will intensify the competition among crudes from various areas for given markets. The problem will be further aggravated by increasing African supplies.

Furthermore, Argentina, the largest South American consumer, may become largely self-sufficient because of its accelerated drilling and development program.

Toward the end of this ten-year period, the U.S. may find it necessary to rely to an increasing degree on imports, because the economics of finding and developing crude in the U.S. will have got too far out of line with the cost of foreign crudes. Over this period, Russia is expected to become a larger factor in supplying crude and/or products to Free World markets, especially Europe. We expect China to develop significant oil production in the next decade, but we do not think its exports will be large.

In the U.S., there should be only moderate shifts in the share of total demand held by different products:

Percent of Total Volume

	1959	1960	1961	1964	1967
Gasoline	42.7	42.9	42.6	42.7	43.1
Kerosine	3.3	3.0	2.8	2.5	2.3
Distillate	19.2	18.7	18.6	18.3	18.2
Residual	16.4	16.5	16.8	16.6	16.2
Other	18.4	18.9	19.2	19.9	20.2

Over the next decade, we think the oil companies will turn more attention to high-energy fuels.

C. W. Lutz
Director, Planning & Economics, Gulf Oil Corp.

How Gulf Sees U.S. Supply

(1,000 b/d)

Year	Domestic & Export* Demand	Supply: Crude	Supply: Natural Gas Liquids	Supply: Imports	Supply: Total
1959	9,661	7,331	850	1,405	9,586
1960	10,154	7,816	890	1,513	10,219
1961	10,536	8,065	915	1,621	10,601
1962	10,874	8,314	945	1,680	10,939
1963	11,204	8,544	970	1,755	11,269
1964	11,494	8,758	990	1,811	11,559
1965	11,851	9,000	1,000	1,916	11,916
1966	12,188	9,000	1,000	2,253	12,253
1967	12,547	8,800	1,000	2,812	12,612

*Lutz predicts export demand will decline gradually, from 278,000 b/d in 1959 to 224,000 b/d in 1967.

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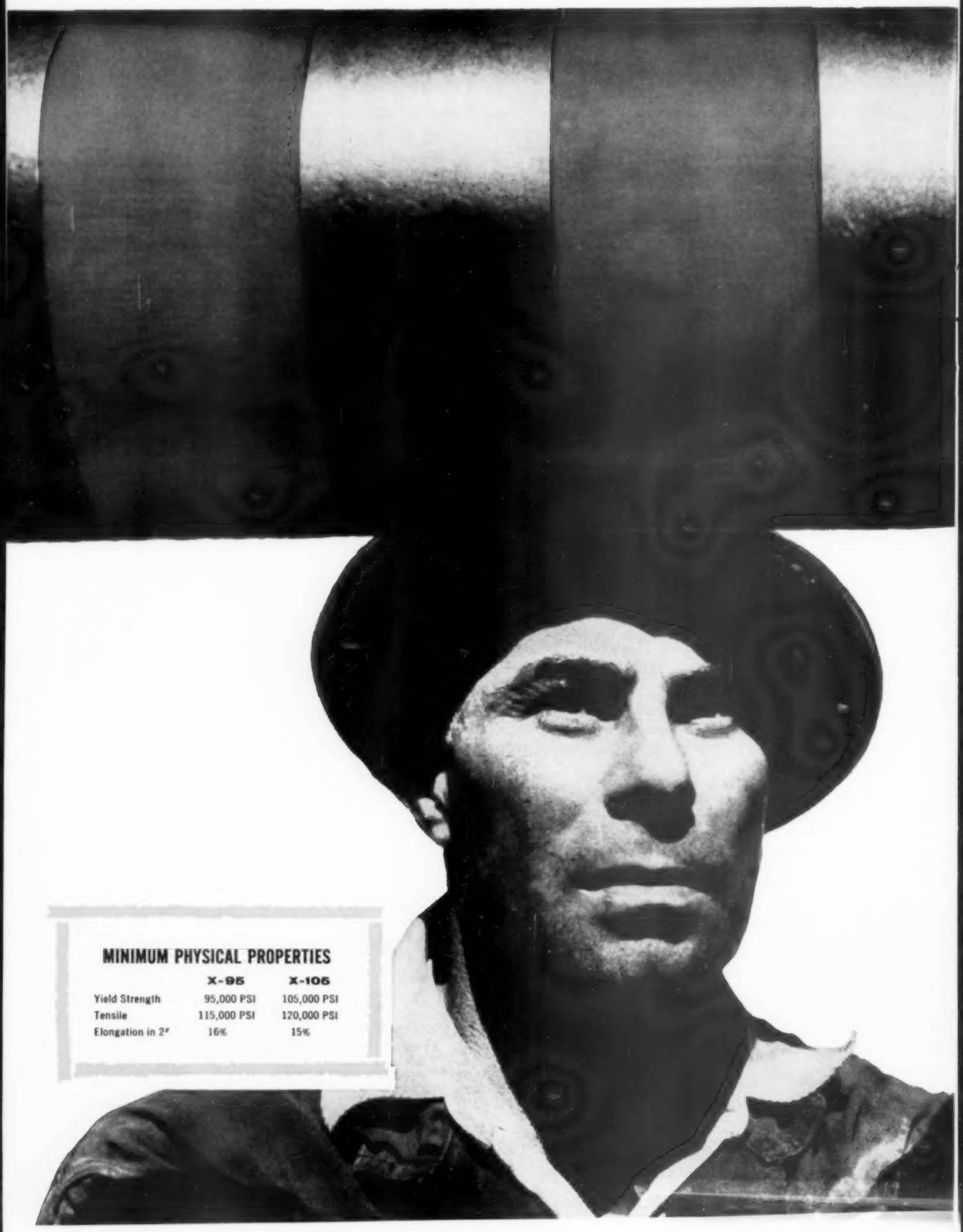

MINIMUM PHYSICAL PROPERTIES

	X-95	X-105
Yield Strength	95,000 PSI	105,000 PSI
Tensile	115,000 PSI	120,000 PSI
Elongation in 2"	16%	15%

X-95
X-105

NOW 2 NEW PREMIUM GRADES OF DRILL PIPE WEAR THE ORANGE BANDS

X-95 and X-105 premium grades are recent Youngstown developments
And they're showing terrific performance in the world's deepest wells

With existing Grades D and E, and now X-95 and X-105, you have an Orange Band selection that's priced and designed for every drilling job you handle . . . including deep hole. Four grades give you greater design latitude, let you buy the strength you'll use—instead of having to pay for strength you'll never need.

Youngstown X-95 and X-105 are available in all API sizes from 2⅞" OD through 5½" OD. Contact your Youngstown Representative for complete data, availability and finishes. Write to our Home Office for your free copy of our new brochure, "Youngstown Drill Pipe". The Youngstown Sheet and Tube Company, Youngstown 1, Ohio.

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SPECIAL REPORT

CENTENNIAL FORECAST

(continued)

JONES Sees Gains for Pacific Coast

Charles S. Jones
President, Richfield Oil Corp. (L. A.)

Fast-growing population and income should keep demand for oil rising.

THERE IS EVERY REASON to look forward to the future with confidence. Studies made by our economists indicate that the population of our domestic marketing area on the West Coast will grow during the next ten years at the rate of 3% per year, compounded. Disposable personal income (income of individuals, less income taxes) in terms of 1957 dollars will grow at the rate of 4½% per year during the same period.

In the light of such estimates, it is expected that the civilian consumption of petroleum products (other than residual fuel oil) will increase at an average rate of not less than 4.3% per year during the ten-year period. We expect that the total demand for petroleum products on the West Coast (District V), which amounted to about 1.3-million b/d in 1958, will amount to 1.8-million b/d in 1968.

To meet such a demand, the petroleum industry on the West Coast will have to look outside California for sources of supply. It is estimated that California production will have dwindled to 400,000 b/d by the end of 1968, compared with 939,000 b/d in 1958.

Heavy Fuel Needs Home—KIRK

Supply shift would ease West's surplus

PACIFIC COAST OIL MEN face the problem of finding markets for the large surpluses of heavy fuel oil that have been produced by natural gas inroads and the high-oil yield of California crudes. The surplus problem may be solved by a combination of measures:

- Importing more light-gravity crude to supplement California crude and thus reduce the refinery percentage yield of heavy fuel oil.
- Importing more refined light products from outside areas to reduce crude runs at refineries.
- Adding still more secondary refinery processes to convert heavy fuel oil to light products.

William F. Kirk
Manager, Economics Dept., General Petroleum Corp.

LOVEJOY Sees Gas as Key

Wallace F. Lovejoy
Asst. Professor of Economics, Southern Methodist University

Its future will greatly affect petroleum

INATTENTION TO GAS REGULATION and gas prices today can prove very costly to oil management in the future. It is true that gas returns much less revenue to the oil company than does the fuel oil that gas displaces. But if gas prices were to rise, not only would gas revenues increase, but revenues from fuel oil would be sustained, since the higher-priced gas would not be able to take over fuel oil markets.

The solution to regulation has not been found in cost-based price-fixing thus far. The industry urgently needs to apply its best minds to the problem of gas regulation to come up with new ideas and fresh approaches. The foundation of regulation is being laid now. The structure that is built, be it good or bad, will last a long, long time.

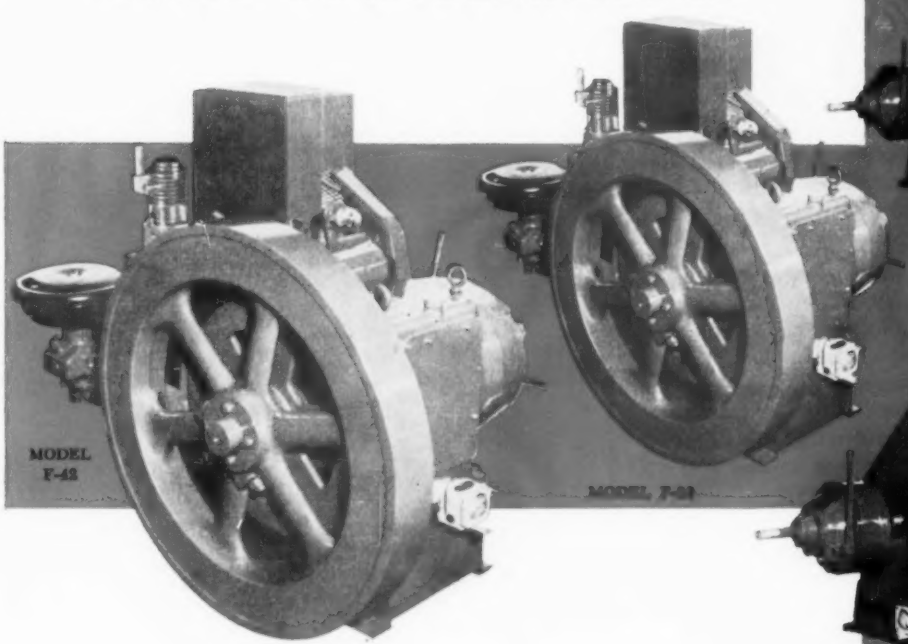
continued ▸

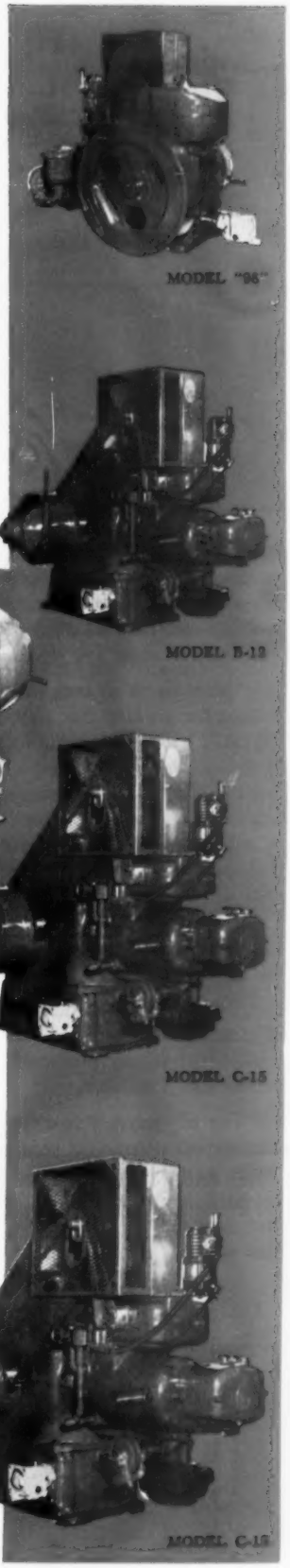
WITTE

Announces

THEIR COMPLETE LINE OF EXTENDED SERVICE ENGINES WITH . . .

Ren-Automation





Witte engines from 4 to 42 horsepower are now equipped at the factory for long operating periods between inspections and are Ren-Automated to eliminate daily attention—the most costly part of oil field engine operation.

Ren Oil Level Regulators automatically maintain the proper crankcase oil level from a separate Ren oil supply system. Ren Exhaust Condensers automatically provide mineral-free water to the engine cooling system by condensing water from the engine exhaust gases.

SEE OUR EXHIBIT

MAY 14-23, 1959
Tulsa, Oklahoma

POWER PLUS CORPORATION

Manufacturers of Ren-Automation Equipment

LOS ANGELES, CALIFORNIA

MR. H. S. M. BURNS,

President and Chairman of the Executive Committee of the Board of Directors, Shell Oil Company

". . . no factor is more essential . . ."

"From exploration through marketing, the success of oil industry operations depends largely on what the military men call logistics—making sure that what you want is where you want it when you want it.

"Most of us oil men in the United States take it for granted that such matters can be easily handled. Getting supplies and equipment ordinarily involves no more than reaching for the telephone. The reason is that the suppliers do such a good job of maintaining warehouses and effecting deliveries. I suspect that many of us become so used to this that we don't appreciate it properly.

"I learnt appreciation the hard way some years ago when I was involved in developing new oil fields in nearly inaccessible tropical jungle, hundreds of miles from the comforts of civilization. We surely missed being able to handle our supply problems by the phone call treatment.

"The oil industry is complex. Its future success will depend on continued performance by all its members. And no factor is more essential or more likely to contribute to that end than the vigorous, progressive companies that supply petroleum equipment."

P.E.S.A.*

* PETROLEUM EQUIPMENT SUPPLIERS ASSOCIATION

PROUD TO BE PART OF A PIONEERING INDUSTRY

PETROLEUM EQUIPMENT SUPPLIERS ASSOCIATION

SPECIAL REPORT **CENTENNIAL FORECAST**

(continued)

PRODUCTION

DAVIS—Plenty of Oil in the Ground

U.S. to get 70-billion barrels more in 20 years.

Morgan J. Davis, President, Humble Oil & Refining Co.

THERE IS REASON for considerable optimism about future domestic oil supplies. The prospects are quite good that estimates of recovery from known fields by present methods will be raised within ten years by 20-billion to 25-billion bbl.

There is a growing realization that the early estimates of reserves assigned to new discoveries are only a fraction of the total volumes that will ultimately be realized through development.

It is estimated that at least 11-billion bbl. more may be recovered from presently known fields by secondary recovery projects still to be initiated. Beyond that, the industry is at the beginning of the practical application of some important new techniques for additional recovery, such as enriched gas drive and other new reservoir treatments, which may substantially raise later estimates of reserves recoverable by both primary and secondary methods.

We must also take into account the untested prospects already located, and future possibilities on some 350-million undeveloped acres currently held under oil and gas leases. On the conservative assumption that only 2% of this leased acreage will produce oil, and that the average ultimate recovery per acre will be 5,000 bbl., the recoverable reserves from new fields on undeveloped acreage held now may exceed 35-billion bbl.

Finally, there are vast new provinces still to be explored thoroughly. These include the tremendous reaches of the new state of Alaska, the Paradox Basin of the Four Corners area, the Green River Basin of Wyoming, the Delaware Basin of Texas, the masked basins of Nevada, unexplored parts of the Williston Basin, and the South Florida Basin.

The sum of the crude that can be counted on from fields already discovered and from acreage already under lease is, conservatively, in the range of 70-billion bbl., to be realized by both primary and secondary recovery in the next 20 years. That is not a gloomy outlook for an industry that has taken 100 years to prove up about 90-billion bbl. of crude.

HELMERICH Sees Larger Contractors

Walter H. Helmerich, III
Helmerich & Payne, Tulsa

Medium-sized drilling firms will find going tough . . . Integration of oil well services coming.

TRENDS IN CONTRACT DRILLING point to fewer, but larger, companies. The proportion of middle-sized companies will decrease. The complexity of operational and administrative functions will require either large staffs, or small organizations exempt from many of the controls imposed on the larger concerns.

There will always be room at the bottom for the small, basically one-man operation which can, through the elimination of overhead, serve a local area more economically than can a large firm. The small concern is able to specialize its equipment to fit the drilling require-

continued ▸

SPECIAL REPORT **CENTENNIAL FORECAST**

(continued)

ments of a specific area, and thus stay in the running.

The real area of alarm is the middle-sized operator with perhaps 15 to 20 rigs. Once he expands from his local area, he encounters all the added overhead that eats up profits. This is especially true of foreign drilling.

It is difficult to generalize on this, but, for example, a ten-rig contractor might do very well in an area such as the Midland area. Another area, such as the Williston Basin, might not support that number of units at all times. Somewhere along the line the contractor must either limit the number of rigs he operates, or expand his area of operation.

Another thing I look for in contract drilling is the integration of services. Today, when an operator wants to drill a well, he must contact several different concerns to survey the location, build the roads, clear the site, drill the hole, provide the mud, run the logs, set the casing, lay the pipelines, and handle a dozen-and-one other jobs. How much simpler and more efficient it would be if the operator could contact only one company for all these services.

This ties in with costs. At present, several small entities must split the profit many ways, running up the over-all cost. If one company could assume all the jobs, the cost would be reduced substantially. I think this will happen in the next few years.

The next improvement in drilling itself will have to come from a definite technological advance—not just an improvement on existing methods. The rates and operational efficiency of drilling contractors have reached a ceiling with present-day equipment. Five years ago I would not have made such a statement. But since then, many inefficiencies in transporting, rigging up, drilling, and other phases of oil well drilling have been eliminated.

Bigger Rigs Coming, Says MATTOX

Size and financing of equipment are problems for the contractor.

Ralph Mattox, Dixie Drilling Co., Dallas

FUTURE OIL AND GAS WELLS will probably be progressively deeper, which will require bigger, better, and more modern equipment. This means that the rigs, as they become larger, will become less mobile than they are at the present.

However, the reverse will be true in connection with barge rigs. In fact, the mobility of barge rigs has greatly increased their use. In a progressively greater number of cases on the Gulf Coast, it is cheaper to dredge canals and use barge rigs than to use land rigs.

Development of lighter drill pipe with increased strength would minimize the growing size of the deeper rigs. Also, the development of lighter and stronger metals would reduce the weight factor in the large rigs and consequently reduce the transportation problem.

The bigger, more modern, and more efficient the deep rigs become, the greater the cost of the rig, and the greater will be the obsolescence and depreciation thereon. This, together with the ever-decreasing margin of profit on the dollar invested, will present a difficult financing problem to the drilling contractor.

CLEGG Sees Labor Upgrading

Tougher drilling will demand it.

M. F. Clegg, Clegg & Hunt, Houston

THE QUALITY OF OUR LABOR is going to have to improve, because five years from now drilling will be more difficult. As we drill deeper, we will be encountering more and more problems. A driller will have to know much more than he does today.

However, the present day roughneck doesn't get as much money as the refinery worker. In the long run, if we pay more for better labor, we will decrease the cost of the well to the company. We will have to be paid more so that we can provide more intelligent employees.

continued ▶

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CHEROKEE PIPE LINE CO.

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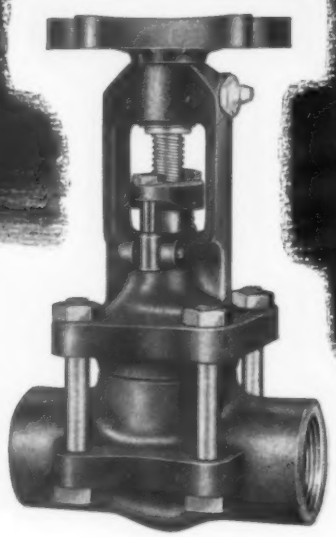
Announcing... a major break-through in valve design

OIC's NEW ½" to 2" ductile iron



PIPE PAL

GATE VALVES

See it at the Oil Show! It's an OIC *first!* OIC proudly introduces PIPE PAL, the first valve designed especially to put the advantages of ductile iron to work for you.

PIPE PAL fills the void in those applications where a more corrosion-resistant valve with greater thermal shock resistance has long been needed . . . applications where forged and cast steel have never fully met the need. OIC's advanced design makes full use of ductile iron's toughness, economy, and corrosion resistance.

PIPE PAL, in ½" to 2" sizes, features an entirely new design—no minor innovation—with proven performance characteristics that will make it well worth your while to review all your present valve applications, and find the spots where you can effect economies to fight the cost-price squeeze with PIPE PAL.

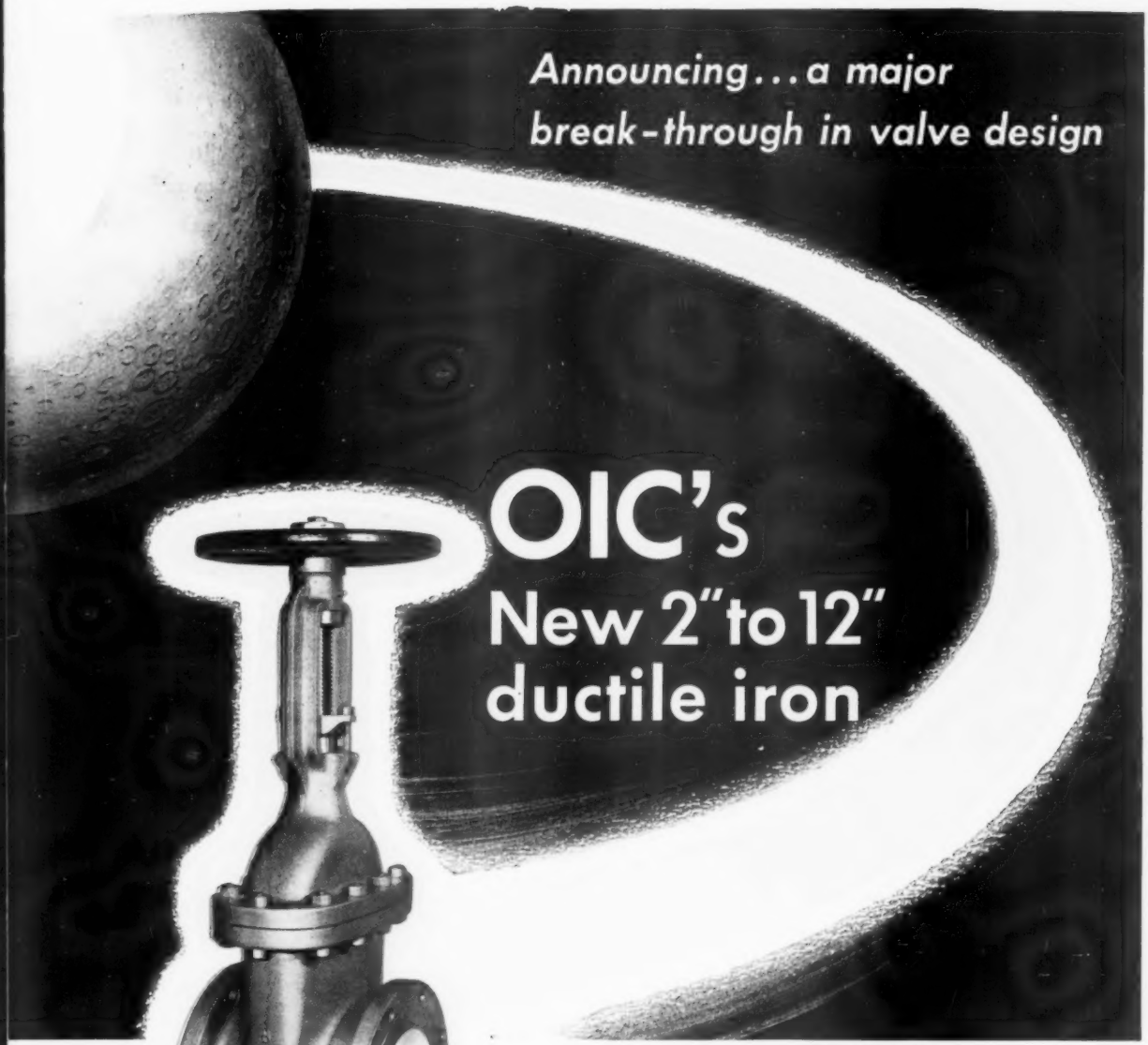
Pressure rating: Screwed 1000 psi at -20° F to 650° F. Flanged: 150 psi at 400° F. Test pressures: 2175 psi shell test, 1500 psi seat test.

OIC VALVES | FORGED & CAST STEEL, BRONZE, IRON & DUCTILE IRON VALVES

The Ohio Injector Company • Wadsworth, Ohio

See it at OIC Booth 219, International Petroleum Exposition

Announcing... a major break-through in valve design



OIC's New 2" to 12" ductile iron

PIPE MATE

GATE VALVES

See it at the Oil Show! It's new! OIC proudly introduces PIPE MATE, the first valve designed specifically to give you all the proven advantages of ductile iron:

- Strength and toughness of steel
- Economy of iron
- Wear and corrosion-resistance you've been looking for

PIPE MATE, in 2" to 12" sizes, features an entirely new design—not a "remake"—engineered to meet the dimensional requirements of A. P. I. Standard 600.

Thorough testing has proved that PIPE MATE will resist corrosion better than steel, withstand thermal shock, and provide excellent wear. Yet the cost is considerably below the level of steel, to provide an exciting economic attraction.

Pressure rating: 220 psi at -20° F to 100° F. 150 psi at 400° F. 100 psi at 650° F. Test pressures: 425 psi shell test. 300 psi seat test.

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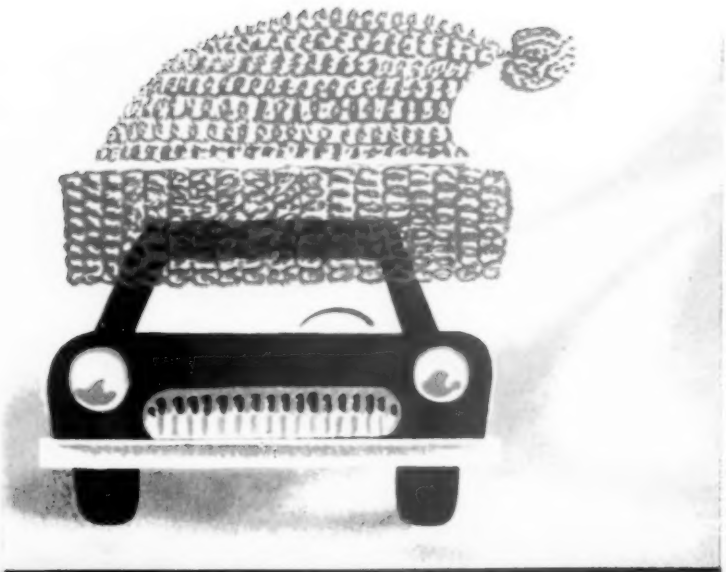
See it at OIC Booth 219, International Petroleum Exposition



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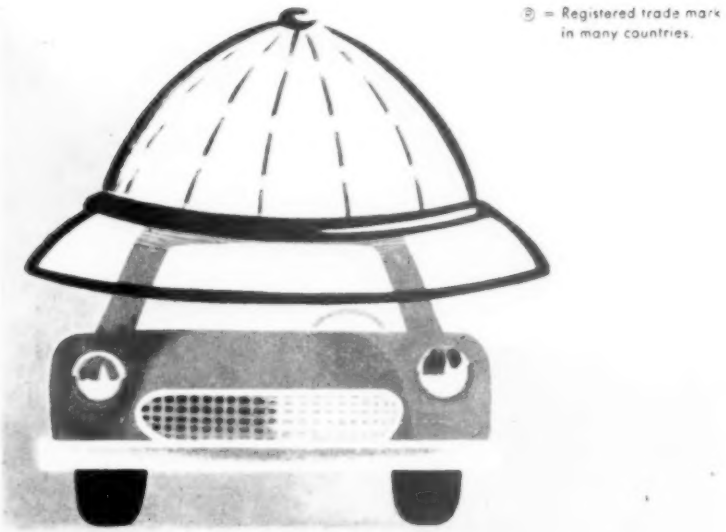

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(continued)

Stripper Wells More Vital—McCLURE

Their share of U.S. oil reserves is swelling . . . Recovery ratio is rising

Harold McClure
President, National Stripper Well Assn.

STRIPPER WELLS WILL ACCOUNT for an increasing and important part of U.S. oil reserves in the decades ahead. Considering as strippers any wells that produce under 10 b/d, regardless of the stage of recovery, we find that of the half-million producing wells in this country, 372,000 are strippers.

About 26,000 producing wells are being added each year in this country. Of these, 12,000 are strippers, or become strippers in the first year. Using the 1958 figures, there are some 8,600 stripper abandonments annually. This net gain of 3,400 stripper wells a year is a good projection for the foreseeable future.

It used to be that operators recovered only 10% to 15% of the reserve in a given stripper well. Now we want at least 50% to 60%, and in some cases as much as 80%.

Wells are like people. They begin to die the day they are born. If you prematurely abandon them, they are lost forever.

It takes a terrific amount of ingenuity and technical knowhow to recover stripper reserves, but that is our stewardship for the future.

MITCHELL—Prices Decide Future

They must give producers a fair return.

John Mitchell
Chairman, Mitchell & Mitchell, Houston

FINANCING IS THE BIG PROBLEM facing oil producers. The independents generally will be as successful in ten years as they are now—provided that the price of crude allows operators to drill and produce oil profitably. However, there will be fewer and larger companies. It is evident today that new independents are unable to enter this business, because it costs more to find a barrel of oil than the independent can sell the oil for. Only the larger operators, who have a backlog of geological information, leases, and stable production, are capable of carrying on profitable operations.

Gas prices must be increased to insure reasonable exploration. Gas on the Gulf Coast should be priced at a minimum of 25¢ per Mcf. within the next five years.

Domestic Oil Stronger—BROWN

Competition from imports will be less.

Russell B. Brown
General Counsel, Independent Petroleum Assn. of America

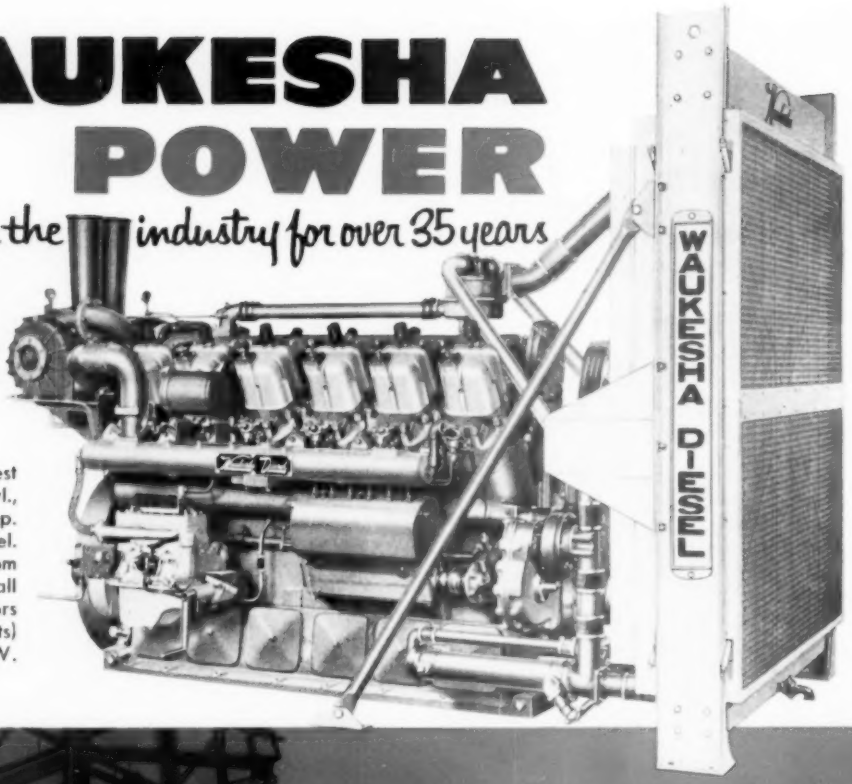
THERE IS A STABILITY in the industry now that has not been present since the end of World War II. There is the promise of greater use of the products of the domestic industry. Whether this promise is realized depends to a large extent on the industry itself. U.S. demand for oil over the next ten years will increase by nearly 3-million b/d—about the same amount it increased during the past ten years.

Whereas during the past ten years imports of foreign oil assumed a large share of that increase, during the next ten, domestic crude should get a greater share of the increasing demand. In order to meet the anticipated demand in 1968, the domestic industry should maintain a vigorous program of drilling.

continued ▸

WAUKESHA POWER

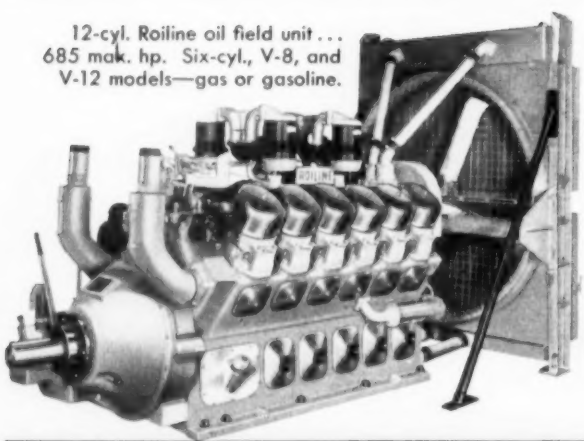
dominant in the industry for over 35 years



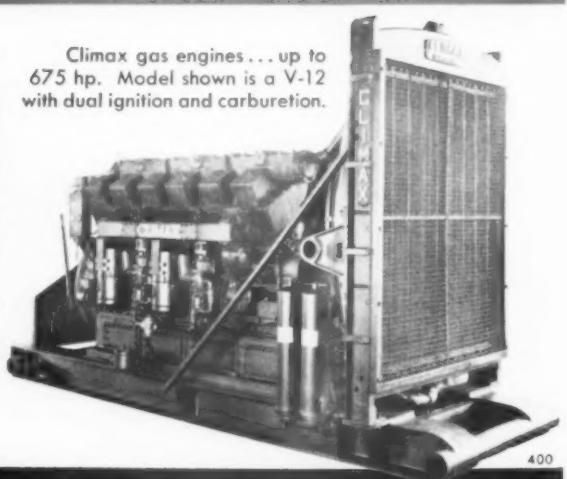
One of the biggest Waukeshas—a 12-cyl., 5788 cu. in., 1235 hp. turbocharged Diesel. Complete line ranges from 10 hp. for use with all standard fuels. Enginators (engine-generator sets) to 800 KW.

Since they first entered the oil fields, back in 1922, Waukesha engines have earned an enviable reputation for reliability and long, useful service. Now . . . long famous for its wide range of models, Waukesha's recent acquisition of the well-known Climax and ROILINE (formerly LeRoi) oil industry engines makes available a variety of sizes unmatched by any other engine builder—complete coverage to over 1200 horsepower, for use with all standard fuels.

12-cyl. Roiline oil field unit . . . 685 mak. hp. Six-cyl., V-8, and V-12 models—gas or gasoline.



Climax gas engines . . . up to 675 hp. Model shown is a V-12 with dual ignition and carburetion.



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SPECIAL REPORT **CENTENNIAL FORECAST**

(continued)

Charles T. Whitney
Coastal Drilling Co., Bakersfield, Calif.

WHITNEY Calls Service Key to Future Success

Drilling firms can't lower their standards . . . They need new frontiers.

QUALITY OF SERVICE will decide how successful drilling contractors are in the future. And there is a danger in trying to expand too fast. We have seen contractors go from 4 or 5 rigs to 15 rigs, and fail to give the same quality as with fewer rigs. One reason is the labor question, which is going to be one of the contractor's continuing problems. As long as we can stay small enough to handle our own grievances as they occur with our own men, we will minimize the problem.

An important question for California contractors is where to find new drilling frontiers. The number of rigs in California for the amount of available work means that someone is going to have to move over. The West Coast people can expect to see a downhill trend in drilling because of the tremendous number of wells drilled in California and the number of dry holes.

We have been fortunate to be in on the ground floor in Alaska, and we are going to concentrate on developments there. We feel there will be five years of work in Alaska for two or three rigs, regardless of whether they find another drop of oil or not. It's going to take five years of continuous wildcatting to prove or disprove the theory that there's a big field on the Kenai Peninsula.

Equipment is getting better all the time, but I would like to see a good combination engine that could be used for diesel or gas.

continued ▶

what does

$$\triangle F/A = \triangle p$$

mean to you?

(Continued on next page)

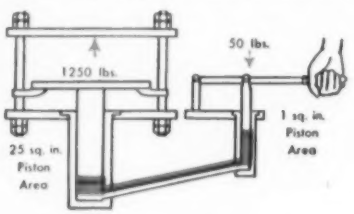
(Continued from preceding page)

$$\triangle F/A = \triangle p$$

. . . is the mathematical expression for Pascal's Principle which states that: "pressure applied to a confined fluid is transmitted uniformly to all areas of the confining fluid."

In the drawing below, notice how a relatively small pressure of 50 pounds applied to the 1 sq. in. piston raised 1,250 pounds on the 25 sq. in. cylinder. Pascal discovered how to multiply the muscles of man a thousand fold! Today, the light touch of a woman's toe against a foot pedal smoothly yet quickly slows and halts a two ton automobile.

Pascal's Principle had been known for hundreds of years when a man by the name of Sven Nordstrom successfully applied the principle to



Here is a demonstration of Pascal's Law. A given pressure of 50 lb lifts 1250 lb over an enlarged area of 50 to 1 ratio

create a most unusual innovation in valves—his invention, the lubricated plug valve. In the most elementary terms, this valve is simply an old fashioned plug cock (used since the days of Pompeii) to which Nordstrom ingeniously applied the Principles of Pascal.

Robert B. Montgomery, Casey & Montgomery, Bakersfield, Calif.

MONTGOMERY Sees Lag In Drilling on West Coast

Contractors eye new areas . . . Worker relations should improve.

DRILLING CONTRACTORS IN CALIFORNIA have a lot of major problems to overcome before they can be any more successful than they are now. One of the biggest problems is the fact that the drilling business is being curtailed because of the current oversupply of oil. Being a coast state, California is very subject to world supply and demand conditions.

Another big problem is finding new places to drill. This is becoming more difficult all the time. California has been picked over a bit more than a lot of other areas. There will be drilling in the state for many years, but this will be restricted, with many ups and downs, rather than an expansion.

For some contractors, therefore, the main business change ahead will be a broadening of operations to include other areas that are opening up, such as Alaska.

Another change, and it is already a trend, is that the drilling business is going to require a higher percentage of people with technical backgrounds, primarily mechanical and petroleum engineers.

From now on, there will be more attempts to improve communications among various levels of the business—management, foremen, and workers. We are starting a program of informal meetings. These are short, after-hours meetings and small dinner parties.

In field work, we expect to see greater utilization of microwave radio, as it becomes more available and less expensive.

SPECIAL REPORT **CENTENNIAL FORECAST**

(continued)

Paul R. Schultz, Blackwell Oil & Gas Co., Tulsa

SCHULTZ Says Producers Must Grow to Compete

Small operators can't finance deep holes . . . Imports curb fair.

INDEPENDENT OIL PRODUCERS must increase their relative size if they are to remain competitive. This can be achieved either through amalgamation with other companies of comparable size, or through the formation of standing working agreements.

A company of our size must set some monetary limit above which it cannot go on most deals. We have set an arbitrary limit of $75,000. However, many of the areas in which we are interested require drilling investments of $300,000 to $400,000. Our only means of justifying such ventures, therefore, is to enter into deals with other companies capable of sharing the cost.

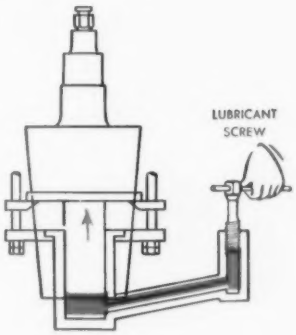
It is my belief, for example, that there still remains more oil to be found in Oklahoma than has been previously located. But it will be deep—and expensive. To compete, the independent must be able to drill more costly holes.

As for government controls, I do not regard federal control of foreign oil imports to be socialistic. As long as the domestic producer is regulated through our proration statutes, then the foreign producer must also be regulated. And the federal government is the only likely candidate for the job.

I don't advocate such a step, but if the domestic producer were to be relieved of all governmental control and restraint, then I would have no qualms about competing on an equal footing with any economy in the world.

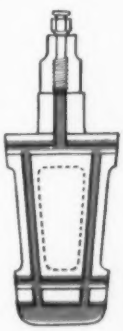
continued ▸

The perfect application of a principle



The lubricant system in the Rockwell-Nordstrom valve is a closed hydraulic system acting much like the two pistons shown on the facing page. Instead of having a separate piston to "charge" lubricant into the valve, the screwed lubricant fitting at the top of the plug acts as the first piston. When lubricant is forced through the fitting by a pressure gun or if the lubricant screw is manually turned down, hydraulic force is magnified and forces lubricant through the channels in the plug.

The plug then acts in much the same fashion as the second piston. A shot of lubricant from a pressure gun or a few turns of the lubricant fitting minutely unseats the plug upwards against the resilient shoulder seal, freeing the plug for smooth, easy turning.



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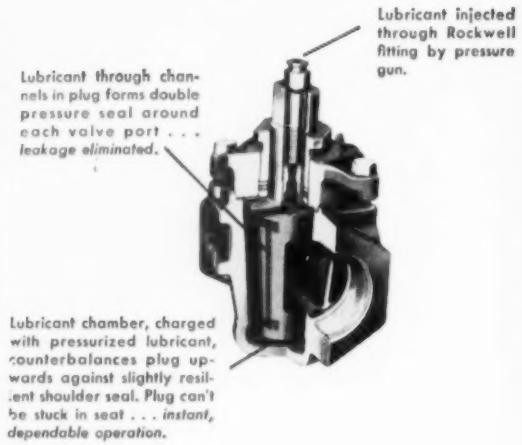
Here's why Rockwell-Nordstrom valves work better, easier and cost less to use, thanks to

$$\triangle F/A = \triangle p$$


Lubricant injected through Rockwell fitting by pressure gun.
Lubricant through channels in plug forms double pressure seal around each valve port . . . leakage eliminated.
Lubricant chamber, charged with pressurized lubricant, counterbalances plug upwards against slightly resilient shoulder seal. Plug can't be stuck in seat . . . instant, dependable operation.

The drawing above shows how lubricant in Rockwell-Nordstrom valves assures the bottle tight shut-off, smooth, easy operation and unmatched dependability that users have learned to expect over the past forty years. Rockwell-Nordstrom, the *original* lubricated plug valve, is also the world's most complete line. They cost no more to buy, often less, than ordinary valves. Whatever your valve needs, there is a Rockwell-Nordstrom valve that will do the job better, longer and at lower cost. If you'd like to know more about these valves or if you'd like to talk with a Rockwell field sales engineer, write Rockwell Manufacturing Company, Pittsburgh 8, Pa. Canadian Valve Licensee: Peacock Brothers Limited.

ROCKWELL-Nordstrom VALVES

it's ROCKWELL

MANUFACTURING COMPANY

SPECIAL REPORT **CENTENNIAL FORECAST**

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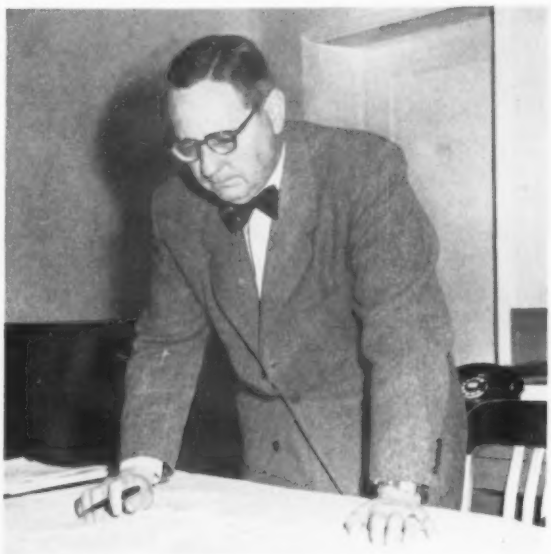

Leonard R. Seaman, Intex Oil Co., Bakersfield, Calif.

SEAMAN —Breakthrough In the Technology of Drilling

Steel and labor to be trimmed . . . Downhole tools perfected.

WITHIN THE NEXT TEN YEARS there will be a complete breakthrough in the techniques of drilling, completion, and, to a lesser extent, production. Oil wells will be drilled in an entirely different manner than at present—in a way that will tend to eliminate the necessity of high-cost steel and labor.

Greater drilling depth will be achieved with lighter equipment, and casing probably will be eliminated. There will be more positive identification with respect to permeability and porosities. Possibly the seismograph or a similar device will be perfected as a positive tool for the location of stratigraphic traps. Among the innovations I would like to see:

- A new drilling technique to eliminate the use of drill pipe. (This, in turn, would permit lower-powered units, smaller equipment, faster drilling, and less downtime. The objective would be to achieve a $1-a-ft. drilling rate to depths of consequence. This would permit the discovery of a great many stratigraphic traps by means of low-cost, random drilling.)
- Perfection of some type of pressure device that would maintain the walls of the hole intact, without the need to run casing.
- Development of low-cost, bottom-hole heating, with intensified heat and widespread areal contact.
- An economic, continuous coring device that would be effective to depth.

continued ▸

introducing:

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FOR HIGH PRESSURE DRILLING AND PRODUCTION SERVICES

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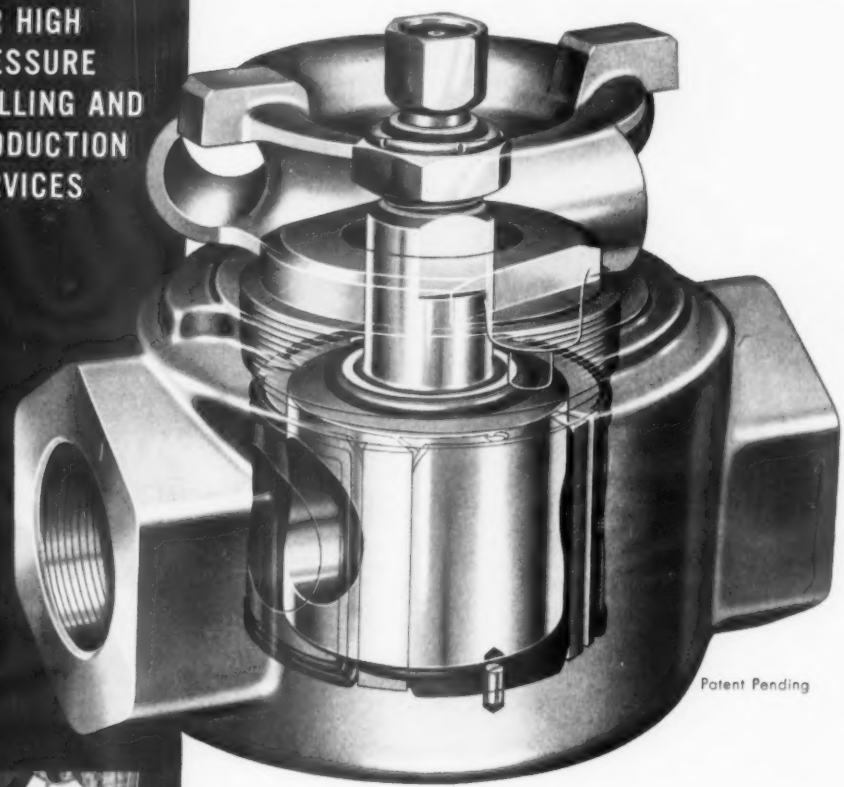
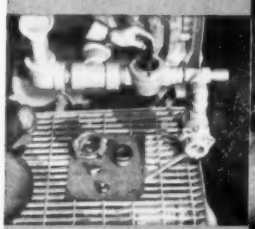
PLUG CAN'T STICK

READILY OVERHAULED IN LINE

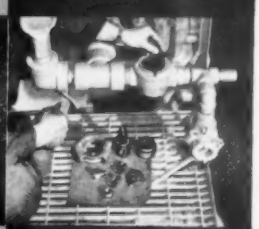
Here is without question a new, revolutionary in design, plug valve. Designed for high pressure services, this valve can't stick or freeze. It can be overhauled to like-new condition in the line. It requires no adjustments, no special tools for operation or maintenance. It is considerably lighter in weight, yet actually stronger than heavier units. It can be operated easily under pressure. And it costs considerably less than present valves now being used in high pressure service. Get the details on this new Hamer Valve from your local Hamer representative or write to the factory for detailed literature.



Patent Pending



1 Valve can be disassembled in the line using conventional hand tools.



2 Replacement kit permits reconditioning valve to like new effectiveness in less than 10 minutes.

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SPECIAL REPORT **CENTENNIAL FORECAST**

(continued)

PROCESSING

Petrochemical Fuels to Soar—MURPHREE

Rising octanes may lead to use of hydrocarbon derivatives in gasoline . . . Petrochemicals will help power the space age.

CONTINUED EXPANSION in the petrochemical field lies ahead. Already, the rate of capital investment in U.S. petrochemical plants almost equals that for petroleum manufacturing—roughly $750-million a year vs. $800-million. The greatest petrochemicals growth will be in fibers, in construction and building materials, and in agriculture.

The impact of petrochemicals on fuels is typical of what we may expect in the future.

As octane requirements for motor gasolines are increased, we must go more and more to chemical processing, and even to the use of chemically pure compounds. We know there is a limit to the octanes we can get from hydrocarbons alone.

It may well be that in the future we will have to go, in part, to hydrocarbon derivatives, such as oxygen or nitrogen compounds, which are produced essentially as pure chemicals in petrochemical processing.

We can also expect further improvements in equipment and materials that are used to handle petroleum and its products.

I am thinking here of better surface coatings, oil-resistant polymers, lighter and more flexible packaging equipment, and greatly improved lubricants, capable of withstanding high temperatures or the effects of radiation.

Petroleum chemicals and petroleum-based fuels will continue to play a major role in the glamorous field of rockets, missiles, and space ships, and other aeronautic and astronautic craft.

For purely military purposes—such as long-range missiles—solid propellants will probably displace liquids. For outer-space travel, however, liquids will play a very important, if not a predominant, role.

The most important liquids—at least for rocket power—appear to be those based upon the carbon-hydrogen and carbon-nitrogen-hydrogen compounds. Petroleum will continue to be the main raw material source for these, because the carbon-hydrogen compounds are basic to petroleum, and the nitrogen can be produced through petrochemical-derived ammonia.

In the field of liquid hydrocarbons, the trend seems to be to increase fuel density in order to obtain greater overall efficiency. High hydrogen content is also important.

There has been much talk about the use of the liquid boron fuels in turbine-type and ramjet aircraft applications. This possibility is still under military secrecy.

In the case of the solid propellants, we find, surprisingly, that they draw even more heavily upon the basic technology of the petrochemical industry than do the liquid fuels. This is because the solid materials require the presence of an elastomeric polymer for cohesion of the propellant mass. The petrochemical industry is very familiar with elastomers, and has actually pioneered in this area.

E. V. Murphree
President, Esso Research & Engineering Co.

The lighter metals, such as lithium and boron, may well come in as basic components of solid fuels. However, these may very well be modified by union with carbon or nitrogen compounds—in which case they would be subjected to a considerable amount of processing of the basic petrochemical type.

I am convinced that the fuels of the future will continue to be the product of the interdependence of petrochemicals and petroleum.

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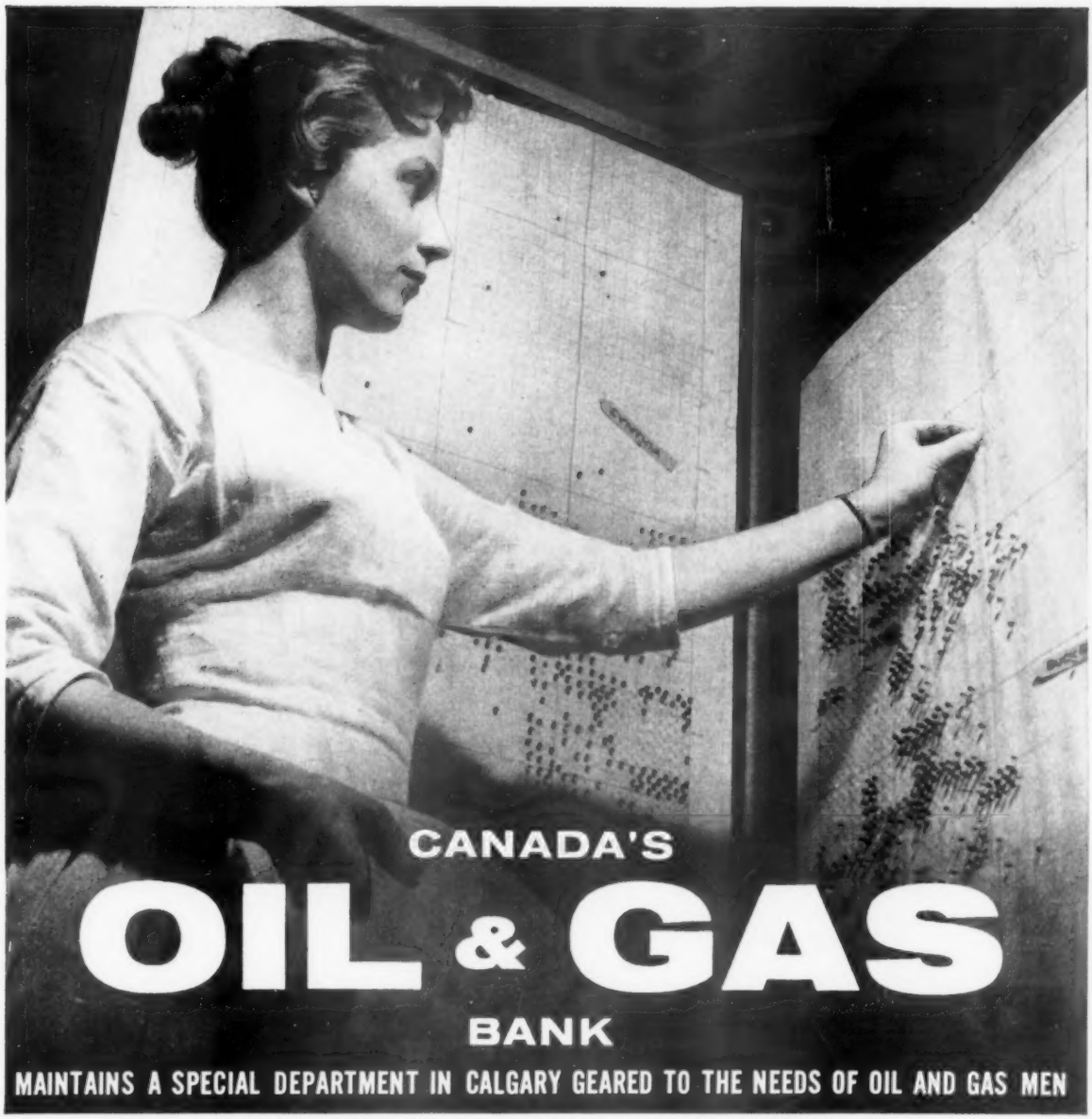

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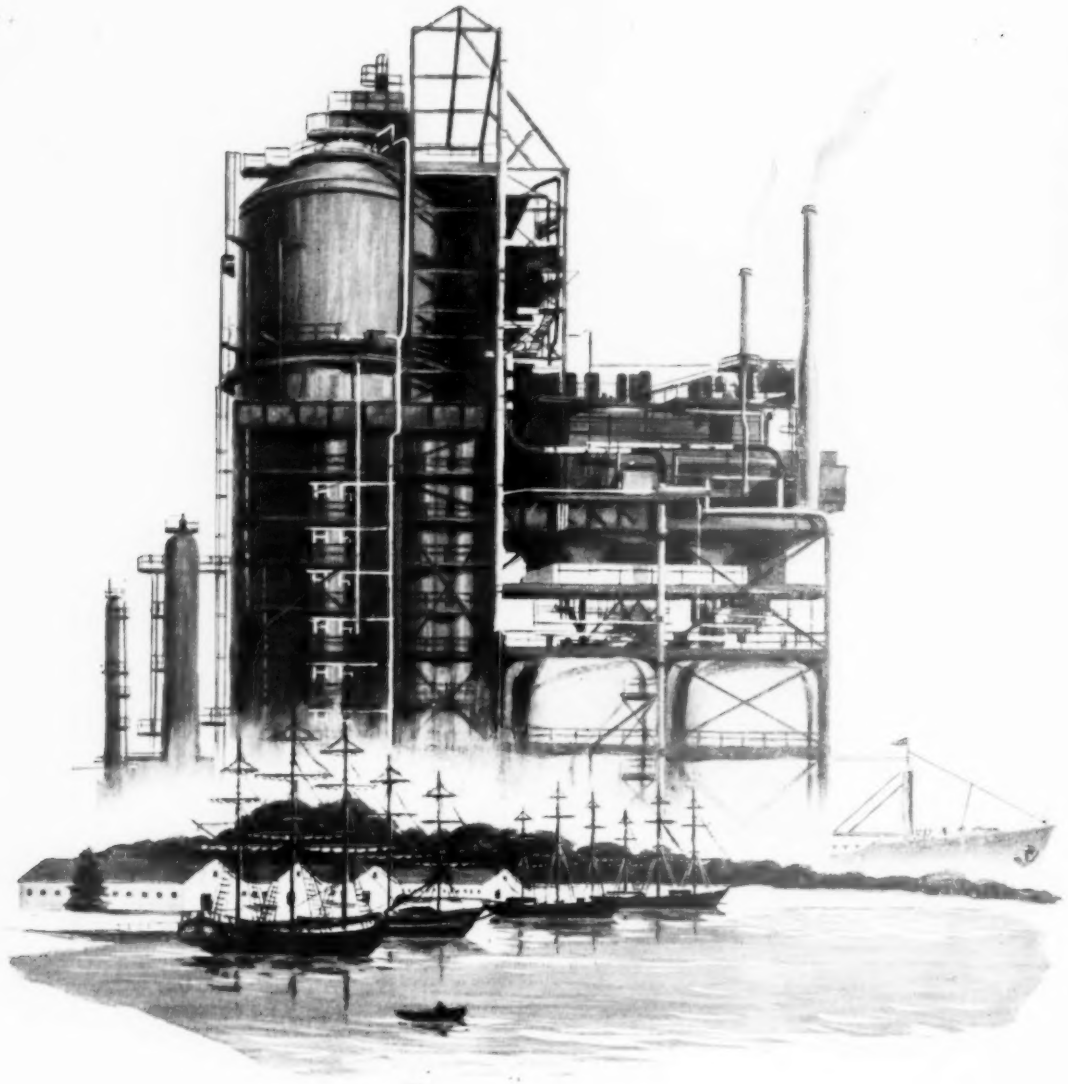


Right from the early days...

when oil was first taken from the ground at Titusville, Atlantic history took shape. In 1861 the men who later founded Atlantic shipped to London the first full cargo of oil ever to leave this country. In 1870 they formed The Atlantic Refining Company which pioneered the industry's first "Tower" stills . . . first modern service station in the East . . . first combat aviation gasoline . . . first use of atomic energy in petroleum research, and many other advances.

Today—as an integrated company—Atlantic still is busy pioneering and progressing. Atlantic produces oil here and abroad. Transports it with an ocean-going tanker fleet, over 3600 miles of pipeline, more than 1600 motor vehicles. Refines oil at Philadelphia and Port Arthur, Texas, into hundreds of products. Markets from New England to Florida and west into Ohio, and also abroad. Prepares for the future in modern research laboratories. This is Atlantic.

ATLANTIC

THE ATLANTIC REFINING COMPANY

Producer, refiner and marketer of quality petroleum products

Human Factor Is Stressed by THAYER

Refinery automation must overcome continuing resistance to change.

THE TREND TO AUTOMATION will be greatly accelerated in the oil industry in the years ahead. Creating a refinery organization compatible with an automation system can be accomplished most easily when the organization and the system are combined in a brand new plant. But such easy jobs will be coming along less frequently. Forced upon us increasingly will be the much harder job of designing systems and organizations, and fitting them into existing plants.

We at Sun see no escape for oil refiners from the constant need to convert, alter, and automate their plants to keep them operating competitively three to four times as long as was necessary 25 years ago.

Scrapping an old plant and building a new, improved one may still make technical sense for oil management, but it makes far less technical sense than has been the case in the past.

Management will be confronted with human nature and its resistance to change, and with rigidities encouraged by labor unions.

Until now, management has been derelict in its responsibility to communicate with and inform the workingman. I will go further and state that I believe management's greatest failure has been in the field of human relations.

While some union leaders were busy persuading employees to resist every change, management in many plants

Clarence H. Thayer
Vice President, Manufacturing, Sun Oil Co.

permitted the problems to pile up until the accumulation of resulting inefficiency could be tolerated no longer. Then there came a labor upheaval, or a complete shutdown of a plant, or a reorganization in which hundreds or perhaps thousands of men were laid off.

In the years ahead, the objective of oil management will be to introduce advances on a schedule that will avoid disruption and hardship to personnel. Management must bring improvements in existing units into being at a rate that will match the declining manpower requirement with the normal reduction in employment occasioned by retirement and other ordinary causes. This will not mean a reduction in over-all industry manpower. New opportunities for oil people will be created by expansion of the industry.

SIMPSON—Refineries Will Grow

Thomas P. Simpson
General Manager, Engineering & Operations Analysis
Socony Mobil Oil Co.

Emphasis will be on streamlining, and on lowering maintenance costs.

OVER THE NEXT 25 YEARS there will be a general trend toward larger refineries and larger individual process units. The economic size for any given operation will be a compromise among supply-distribution considerations, initial investment, and maintenance requirements. Low maintenance costs will receive increased emphasis in the initial design.

We intend to improve the operation of our old facilities in terms of lowering costs and heightening efficiency. New refineries will be integrated through the use of better equipment, which should decrease maintenance by lengthening the intervals between turnarounds.

We expect improvement through fundamental development in both the engineering and process designs of refining equipment. These probably will come from research and development, and will be significant but not spectacular. Hydroprocessing should be of increasing importance.

continued ▶

MINCKLER Sees Boost in Gasoline Capacity

More coking and alkylation facilities needed . . . Price chaos will end.

R. L. Minckler
President, General Petroleum Corp.

FROM THE STANDPOINT of refining economics, we face the problem of too much heavy fuel oil on the Pacific Coast. Our gasoline demand is increasing at a reasonable rate, and down the road we are going to need more gasoline. So this year we are starting the construction of an increase in our coker capacity. When that is completed, it will be possible, as our gasoline demand increases, for us to step up the production, development, and drilling of new oil wells to supply our coking facilities with heavy crude. We could not do anything with that heavy crude if we had it today because we do not have the manufacturing facilities, and the market does not demand it at this time. When we have the manufacturing facilities, we will have to go back into the oil fields and step up our rate of drilling and development activity.

If demands for improved quality and higher-octane gasoline continue as they have in the past, we will find a need for additional alkylation facilities.

There is a very good prospect that refiners will be able to look forward to an improvement in the gasoline price situation, simply because a lot of people have been going broke very fast. Even should gasoline supply remain the same, and demand remain the same, the competitive urge to get rid of product at any price will be tempered.

AUTOMOTIVE

Turbine Cars? Maybe, Says RAVIOLO

Octane pressure easing . . . Auto makers eye less service . . . But sealed engines are doubtful.

V. G. Raviolo
Special Asst. to Vice President, Engineering Research, Ford Motor Co.

GREAT CHANGE AND INNOVATION will appear in the automotive industry in the next ten years. This will be brought about by changing demands in the U.S., and the concurrent growth of the European common market.

Automotive turbine projects are constantly progressing, but no target date for general use has been set by any company. It may never be set. Remember that turbines must first catch up with a moving target—meaning reciprocating engines that are constantly being improved. Turbines might be useful today in special cases, such as trucks in arctic climates. We could engineer for production right now a 300-500-hp. turbine, if we thought there was any market.

Aluminum engines are coming for limited applications. However, no one will intentionally market a design that calls for any special petroleum requirements.

We seem to be leveling off on octane requirement. An engine compression ratio of 11 or 12 to 1 is the peak for economy. Any further increases in economy will come from new, more efficient reciprocating-engine designs. The smaller the bore, the lower the octane requirement, so compression ratios can go up a little.

However, a lot depends on unpredictable market tenden-

cics. If we have five more years to spend on "economy" research, we will make substantial gains. But if the demand for horsepower starts up again, we will be lucky to hold our own on economy.

One effect of pushing compression ratio higher is a tendency to think of hybrid combustion cycles, between the diesel and Otto. Many people are working on some variation of an unthrottled cycle that would be substantially free of both octane and cetane requirement. Someone will make it work. But it will be on the expensive side, so I look for it first in the truck field.

We in the automotive industry want longer and longer periods of time between oil changes. We must require less service. Our goal is a seasonal change twice a year—with a mileage equivalent of 6,000 to 8,000 mi. I don't think, though, that a "sealed" engine will be a reality in the foreseeable future, because of contamination inherent in a reciprocating engine.

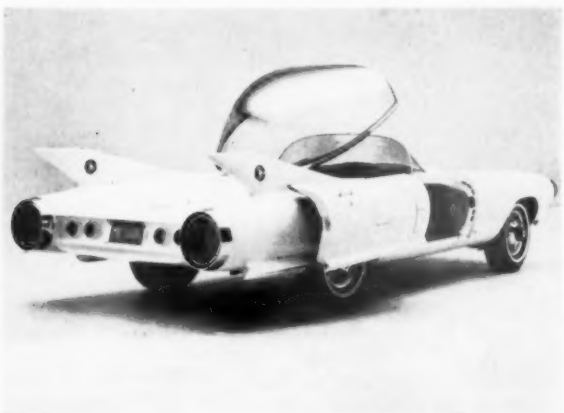
The pressure is on for elimination of grease fittings. Within a few years, they will be reduced to the vanishing point. There is also a real need and desire for sealed cooling systems.

Tire life is now excellent, but can be expected to improve still more. What we need is a leakproof tire that will eliminate the spare, without mechanical gimmicks.

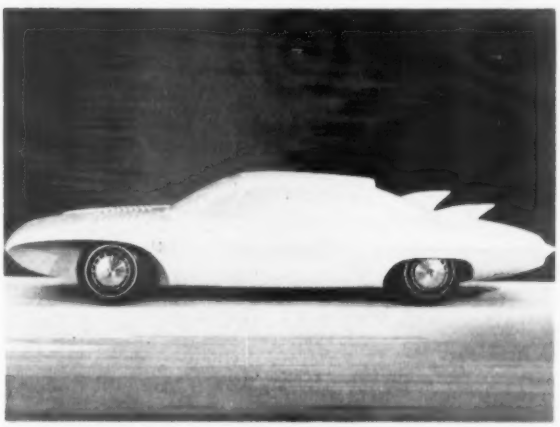
I do not see how we can ever eliminate the need for servicing dirt collectors, such as the oil and air filters. There is no trend toward cutting down crankcase capacity.

Driving a car with electric energy is a possibility 20 years from now.

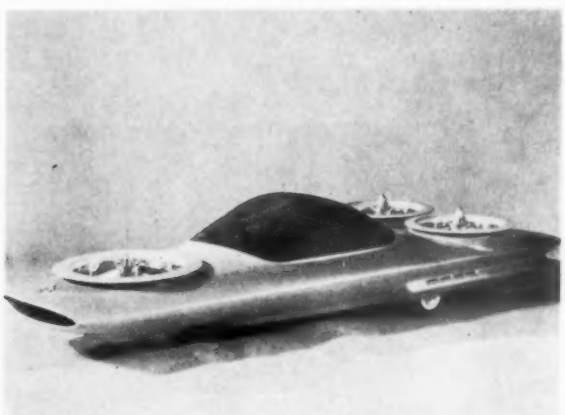
CARS OF FUTURE will look like this . . .



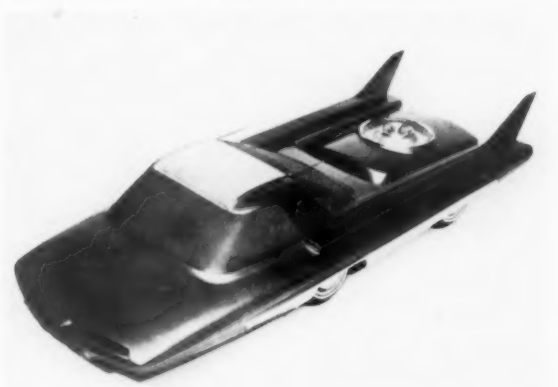
'CONVENTIONAL' cars, with today's reciprocating gasoline engines, will add many new features. Canopy of this Cadillac "Cyclone" lifts automatically as doors slide back.



FUEL CELL would power this model, proposed by DeSoto for 1980 introduction. Car would be driven by electricity, generated from the interaction of hydrogen and oxygen gases.



FLYING CAR, Ford's "Volante," would use two counter-rotating blades in front, with two single-bladed units in rear. (Chrysler is working on flying "Jeeps" for military use.)



NUCLEAR ENERGY would drive this Ford model. Power capsule would be recharged at atomic service stations.

continued ▸

TRANSPORTATION

SMITH Sees Automated Pipelines

Sydney S. Smith, Pipeline Consultant, New York

Minimum manpower will be needed . . . 'Conveyor belt' shipments and smaller pumping stations will cut costs of operation.

THE IMMEDIATE FUTURE of the liquid pipeline industry is fairly clear from changes now in progress. Through the efforts of far-sighted engineers, we will soon see pipelines so completely automated in their dispatching, scheduling, volume accounting, billing, and data-transmission functions that all of these will be accomplished with minimum use of personnel. The equipment to do all of these things is now available, and bits and pieces of this completely automated line are now visible, although many of the devices are too complex and will be improved.

How large can we expect pipelines to become? Some of the major lines, which depend on size alone for their economies, may already have reached their limits. Pumps and prime movers, can, of course, be enlarged, with attendant improvement in economy. Also, preventive maintenance can eliminate much expensive standby equipment now used only in emergencies.

Pipeline employees of the future, while fewer in numbers, will be more highly trained and in consequence better paid.

Better techniques for batch separation and detection will be necessary, but current efforts along this line by ingenious engineers can be expected to bear fruit in the near future.

With such achievements a reality, we can expect to see a "conveyor belt" type of pipeline operation, handling smaller batches with greater frequency—making possible substantial savings in inventory and tankage.

Motive power for future pipelines is the most speculative of any prediction about the pipelines of the future. The fuel cell, the free-piston compressor and turbine, the gas- or liquid-fired turbine, the extremely high-speed centrifugal pumps all are power developments that may find a use in pipelines.

Future line construction will likely call for more and smaller pumping stations, which will make possible a reduction in line pressures, taking advantage of thinner-gauge pipe with consequent savings in capital expenditure. More and smaller pumping stations also offer a way around expensive standby installations, because the temporary loss of a single small station's capacity can more readily be made good by the remaining stations. Moreover, this type of line lends itself more easily to automatic control.

Natural Gas Will Be Strong—McGRAW

Demand is there . . . So are supplies to meet it . . . Controls may ease later.

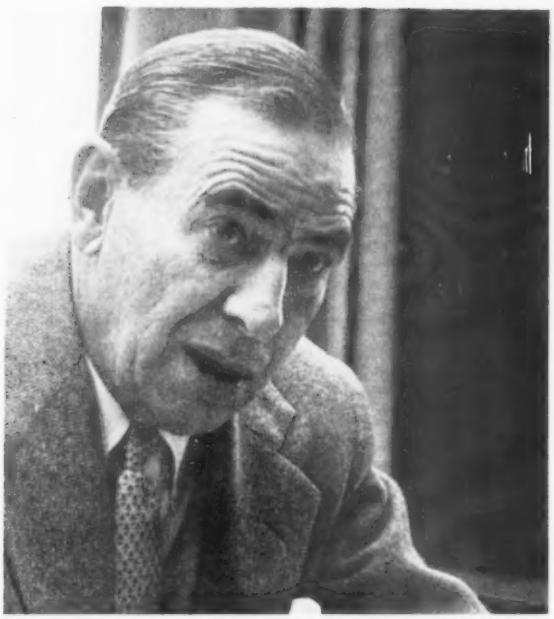
CONTINUED EXPANSION of the natural gas industry lies ahead. We ourselves are undertaking a two-year construction program to increase by 13% the supply of gas for the tremendous New York market and other points along our system. Supplies of natural gas are abundant, both onshore and offshore in the Gulf. The future health of the industry is assured as long as rate increases are allowed to offset increased costs of doing business.

Our biggest business problems over the next ten years will probably be those of government regulation and controls. I do expect more government control of the gas industry. But it is possible that history will repeat itself, and that controls will be relaxed by 25 years from now.

E. Clyde McGraw
President, Transcontinental Gas Pipe Line Corp.

MARKETING

BENTON Sees Marketing Emphasis



Dwight F. Benton
Vice-President, Sales, Standard Oil Co. (Ind.)

Better service and lower unit costs are big targets . . . Electronics and automation will help.

MARKETING WILL BE GIVEN greater attention than ever before in the next ten years. Increasing importance will be placed on consumers' desires and the best possible service to customers, in order to develop and maintain a high degree of brand and company loyalty.

Service stations will have to handle large-volume throughput in order to minimize unit costs. Only the most efficient operators will be able to make a satisfactory profit.

Some marked changes may be anticipated in service station design. We also expect substantial improvements in station equipment, including gasoline pumping systems, ticket printers integrated with gasoline pump computers, and better equipment for servicing smaller cars. We will see greater use of labor-saving devices, such as automation in warehousing and electronic data-processing to speed information and reduce accounting costs.

The biggest business problem over the next decade will be making a satisfactory return on investment. Costs of wages, materials, and quality improvements continue to rise. This will result in narrower margins.

Continued long-range planning will be vital. This includes research for product quality improvements and market research to develop better merchandising methods.

Costs Must Be Held Down, Says RAY

Greater volume through distribution units will do it . . . Market research will gain.

THE GREATEST CHALLENGE facing oil marketers in the next decade will be the need to reduce expenses and improve efficiency—without sacrificing service to the customer. Sales volume through existing service stations must be increased. There must be greater volume throughput from trucks and bulk terminals. The productivity of employees must be raised to offset wage increases. Our own accelerated program to reduce marketing costs will include such additional developments as these:

- Further reduction in the number of local bulk plants, in line with the trend to replace uneconomic plants with larger facilities.
- Decentralization of authority and management responsibility.
- Reduction in the number of echelons of management.
- Simplification of office procedure and accounting systems.

The work of managers will change. They will utilize more market research data applying to: (1) consumer buying habits; (2) effective advertising media; (3) evaluation of employee productivity; and (4) improved efficiency in marketing operations. In addition, greater attention will be paid to the selection, training, and development of supervisory and management talent.

continued ▶

B. L. Ray
Vice-President, Marketing, Esso Standard Oil Co.

SPECIAL REPORT **CENTENNIAL FORECAST**

(continued)

BELLMAN Sees New Marketplace

Vernon Bellman
Vice-President, Marketing, Mobil Oil Co.

Sharper pencils and keener merchandising needed . . . Oil's critics will be busy.

THE MOUNTING COST of marketing and distributing petroleum is our No. 1 concern. We are examining our practices and policies continually in the interest of reducing these costs to an absolute minimum, while still maintaining satisfactory service to our customers. Substantial changes in our current and historical methods of doing business may be necessary to achieve this.

Many of the traditional ways of marketing are now outmoded. More specific action in terms of efficiency, and more aggressive marketing techniques are required.

During the next five to ten years, we will have to meet the problem of climbing federal and state gasoline taxes, which already amount to some 40% of the sales dollar. We will also be faced with ever-mounting legislative investigations. Some will be purely "fishing expeditions," some designed to gain headlines, others will be the result of prejudices. But, whatever the cause, they will be with us, increasing in scope, and resulting in a great deal of wasted time and energy.

In the next 25 years, jobs and opportunities will grow with demand. Therefore there should be more oil companies, both large and small.

Realistic Prices Needed—WRIGHT

Private branders don't rate '2¢ edge'

THE TIME IS PAST when we can accept the traditional spread, or differential, between gasoline prices at local-brand and nationally-advertised-brand stations. Most often, this is felt to be about a 2¢-a-gal. spread, but sometimes it is higher. Obviously it is a carryover from the old days when the private-brand operator took over an abandoned station and sold on price alone.

Today, however, the private-brand stations are modern, attractive, and in fine locations. In fact, they may be better attuned to the times than many long-established marketers, and are setting interesting trends in large-volume outlets.

In the future, in deciding how to meet this competition, we must find a better reason than custom for our decisions.

Willard W. Wright, Vice-President, Marketing, Sun Oil Co.

A. E. Watts
Former Executive Vice-President, Sinclair Oil Corp.

WATTS Urges Economy

Big station investments require close look.

THE GROWING EMPHASIS on economy in oil operations will require a second look at the hundreds of millions of dollars that oil companies have invested in service-station real estate. It will be increasingly important to make sure that the best use is being made of the available property, especially in an industry long known for wise conservation. As only one example, can companies afford to continue with concrete pump islands that have the effect of making the driveway less accessible to the motorists? The solution may well be to place the gasoline pumps below ground level.

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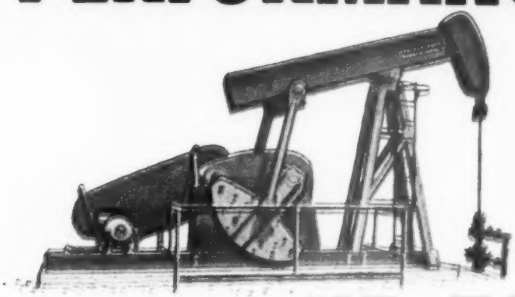

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Big profits wait here for the marketer offering quality lubes and fast service

A big source of profits for the independent oil marketer is the highway and building-construction market. And a big share of this lubricant business goes to the man who offers top-quality products and on-the-site service to contractors.

Sun can help you in two ways:

1. The Sun line of top-quality lubricants can assure you the respect of contractors who want top-quality products to protect their valuable earth-moving equipment.

2. You can ask Sun to help you set up your service facilities and sell your quality-and-service story to busy construction people.

BUT REMEMBER—the products you offer must be right. Let us show you *how* right the Sun line is for your continued success. Write for full details to General Wholesale Department PW5, Sun Oil Company, Philadelphia 3, Pa.

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(continued)

RESEARCH

CURTIS Calls Cheap Production Big Target

R. C. Curtis
Executive Vice-President, Jersey Production Research Co.

Secondary recovery to get more research attention . . . Computers give valuable assist . . . New approaches are needed.

RESEARCH PROGRAMS ARE BEING SHIFTED to put more emphasis on improving operations and lowering investment costs. And a large portion of the oil research effort in the next five years will be directed toward a reduction of the costs of finding and producing petroleum.

The area of secondary recovery probably is the ripest for new technological advances. There has been considerable industry laboratory work along this line. Several techniques now known—such as steam injection, in situ combustion, and miscible-phase displacement, have yet to prove economically feasible on large-scale operations. Waterflooding techniques are good, but can be improved. Greater sweep efficiencies and increased recoveries are key research objectives.

The tools that will make the most important contributions to research are those that improve data handling. Analog and digital computers will be used increasingly in areas where massive data accumulations, such as seismic records, are involved—or where tedious calculations, as in reservoir analysis, are required.

Over-all, research in the producing industry is on the low side, considering either the magnitude of the problems or the ratio of effort to income by other industries.

Much of the oil research dollar will continue to be spent on applied research. However, it will be necessary that considerable expenditures be devoted to basic research, to maintain a vital flow of fresh ideas.

There is considerable concern in the industry over the need for an entirely new geophysical technique. More work is needed on interpretation of seismic records. And the prospects of developing a direct oil-finding tool are not encouraging.

However, much valuable work is being done, promising large reductions in drilling, testing, and completion costs.

LYMAN Predicts More Research Dollars

A. L. Lyman
President, California Research Corp.

Computers will have wide use . . . Oil to develop new fuels.

RESEARCH EMPHASIS in the next five years will be on cutting the costs of petroleum processes, on exploration for stratigraphic traps, and on the development of improved secondary recovery methods.

We expect research expenditures to continue to rise at a moderate rate. Most of the oil research dollar will probably continue to be spent on applied research. However, basic research will increase, and the ratio, relative to applied research should increase at a moderate rate.

Computers will be used much more extensively in the simulation of refinery processes, in the solution of ex-

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SPECIAL REPORT

CENTENNIAL FORECAST

(continued)

ploration and producing problems, and in automatic refinery control. Sensitive analytical techniques that are now so useful in many research areas will be adapted to automatic refinery control.

A direct oil-finding tool is a good possibility in the next five years, but this would not drastically change over-all oil company operations. There will be more offshore exploration and production, and new techniques should be developed in this area.

In the distant future, oil industry technology may contribute to many fields, including (1) the development of nuclear power uses, (2) processing by nuclear methods, and (3) development of fuel cells, special fuels for space flights, and new types of synthetic fibers and plastics.

WESCOTT Sees Petrochemical Surge

Blaine B. Wescott
Vice-President, Research, Gulf Oil Corp.

Hydrogen processing is promising . . . New techniques aid research.

WHILE IT IS DIFFICULT to forecast technological advances with any high degree of accuracy, it would appear that two have a high potential. The first is a much wider application of hydrogen in refining. The second is acceleration in the production of petrochemicals.

Other areas of oil research that will get considerable emphasis in the next five years are exploration and the stimulation of crude recovery, using such methods as in situ combustion. Among the areas that should be getting more attention than they are at the present time are drilling methods and the development of products for extreme service conditions.

Research techniques and tools that in all probability will make important contributions during the next few years are: (1) the field of analytical methods (including mass and optical spectroscopic methods); (2) gas-liquid chromatography; (3) nuclear magnetic resonance; (4) electron paramagnetic resonance; and (5) digital computers.

Oil companies will most certainly be spending an increasing amount of money on research, relative to spending for other purposes. This will be inevitable because of the anticipated growth of petrochemicals. Most of the research dollar will continue to be spent on applied research. However, it appears very certain that expenditures for basic research, relative to applied research, will increase to perhaps twice the present level.

Although it is possible, it is not considered probable that there will be any marked technological breakthroughs in the next five to ten years to produce dramatic changes in oil operations.

Gradually over the next century, as the reserves of crude approach exhaustion, petroleum will become more valuable as a raw material for chemicals than as a raw material for the production of combustible fuels. Almost certainly in the foreseeable future, ways will be found to convert the inherent energy of hydrocarbon fuels directly to energy, with the production of chemicals as byproducts.

THOMAS —'Exotic' Petrochemistry Ahead

Ross W. Thomas
Vice-President, Research & Development, Phillips Petroleum Co.

Radiation processing, new fuels coming . . . Better tools pave way.

PETROLEUM CHEMISTRY of the future may become quite exotic by today's standards. For example, the chemistry of free radicals has scarcely been touched. The possibility of radiation-induced reactions may result in the use of nuclear reactors or particle accelerators in unit processes.

More and more we will learn to duplicate such of nature's processes as we desire. Many believe that, 100 years from now, economically available oil from conven-

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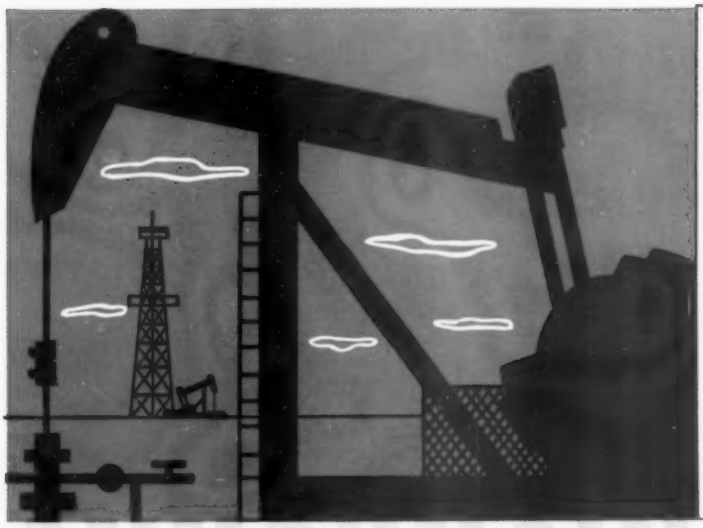

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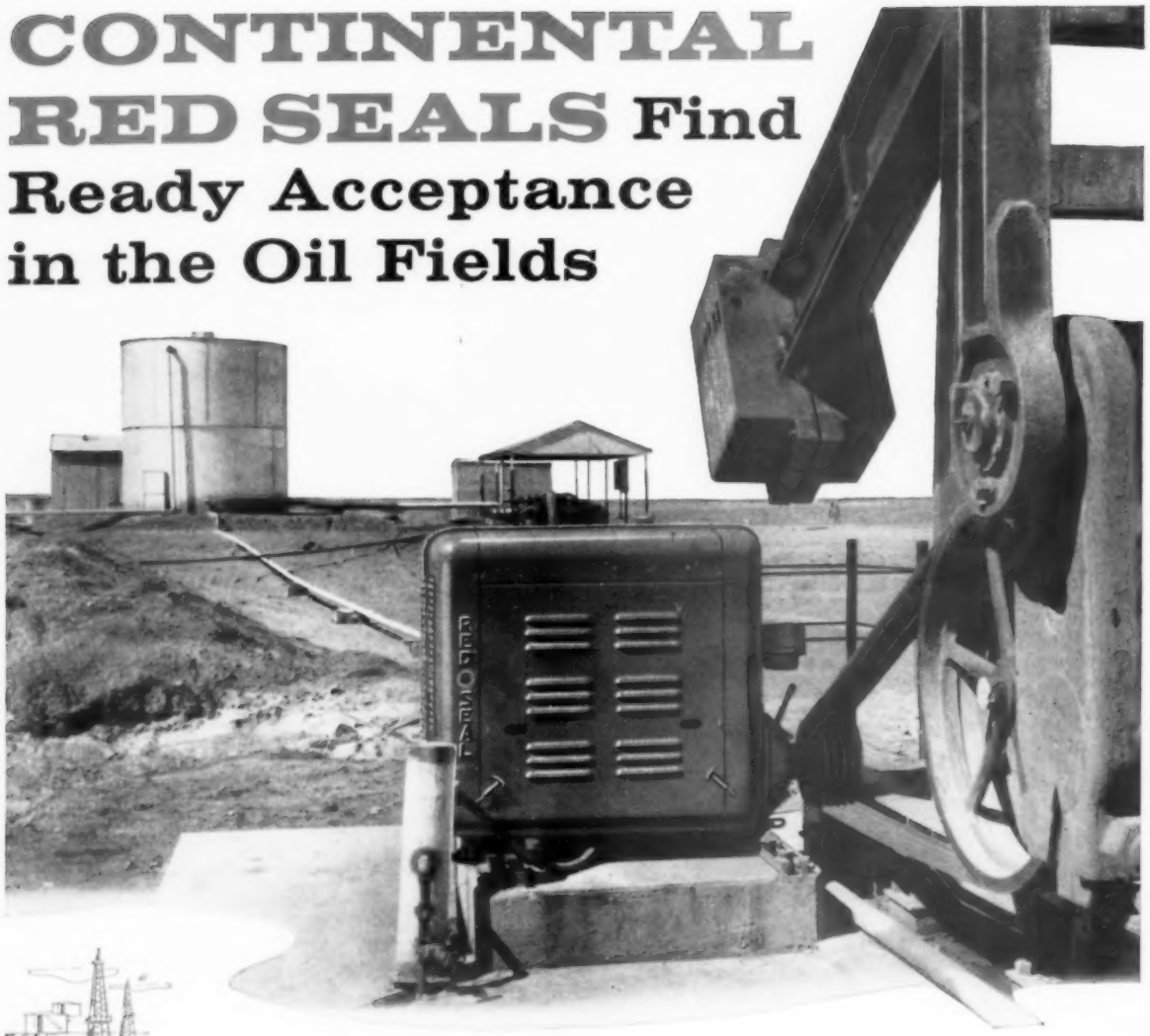
CONTINENTAL RED SEALS Find Ready Acceptance in the Oil Fields



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(continued)

tional reserves will be scarce. But the convenience, transportability, and form utility of petroleum and gas will continue to be attractive. So we may find in the very distant future that hydrocarbons will be synthesized.

In the early years ahead, we expect research emphasis to be placed on better means of discovering primary reserves, on secondary or unique recovery of oil from known reserves, on development of natural gas reserves, on improved catalysts and catalytic processing, and on manufacturing petrochemicals.

New analytical tools will make the most important contribution to near-term research gains. Great advances are accumulating in the precision and speed with which experimental results can be determined and correctly described. High-speed stream analyzers, computers, and integrating devices will provide better control of complex processing.

FLOWERS Expects Sweeping Advances

Research potential big in shale oil, 'direct' exploration, and secondary recovery.

W. M. Flowers
President, Sinclair Research Laboratories

MUCH FUTURE OIL RESEARCH will be directed toward methods of recovering crude from oil shale and tar sands. In exploration, geochemical and electrical methods should receive greatly increased research efforts. Success in developing a direct oil-finding method, which some experts believe is a distinct possibility, would greatly affect our future supplies of petroleum and serve to push back the date when alternate sources would be required.

The rewards that await successful research breakthroughs in secondary recovery are calculable and vast, making it one of the "ripest" areas for new technological advances.

In refining, emphasis will be placed on better catalysts to achieve cost reduction, and improved product distribution. Radiation-induced reactions will be studied extensively, and use of radioisotopes, both in research and commercial operations, will be extended greatly.

Eventually, there must come a time when petroleum will become so valuable as a source of chemicals and motive power for small-engine operation that it will no longer be economical merely as a heat source.

One might imagine that, in the next 100 years, methods would become available to produce all of the world's oil deposits completely and at controlled rates.

Refining Skills Will Grow— WHITE

Chemical-to-electrical energy conversion coming . . . Fossil fuels will be costly.

TWO DRAMATIC DEVELOPMENTS that may come in the next ten years to alter oil operations are (1) the introduction of automotive gas turbines, and (2) the conversion of chemical energy to electrical energy. From the longer-range standpoint:

- Refineries will employ more carefully controlled chemical syntheses, with no waste products. Catalytic conversions will be very specific. Extremely high pressures and temperatures will be used in some cases.
- Fossil fuels will be very expensive by the year 2059. All stationary heat and power plants will use atomic energy. Petroleum and shale oil will be used mostly for chemicals.
- The purpose of the "oil industry" will be to provide fuel for mobile power units. This will be through some conversion process, perhaps one based on low-grade shale, peat, or possibly agriculturally derived raw materials.

continued ▶

Philip C. White, General Manager, Research & Development, Standard Oil Co. (Ind.)

PUBLIC RELATIONS

KING—'Facts' Will Keep Oil Free

Kerryn King (Texaco)
Chairman, Committee on Public Affairs
American Petroleum Institute

American people respect the industry, but are confused by critics . . . Truth-campaign by all oil men will block unwise restrictions.

THE GREATEST POTENTIAL SOURCE of strength of the oil industry lies with the people of the United States. Although they may not be able to recite all the ways in which oil benefits them, they know intuitively that they are living in the Petroleum Age, made possible by low-cost energy.

Unfortunately, this is essentially an emotional reaction rather than one based on knowledge. Because it is, and because of the size and significance of our business, we are vulnerable to every form of direct attack or subtle disparagement. After all, oil is a big, inviting target, and lashing out at the oil industry, as the cynics freely admit, is "just good politics." We have numerous examples of "good politics" at this moment.

Our entire system of free enterprise is threatened by the demands of some politicians to bring the petroleum industry—in one way or another—under the control of the government.

What is the effect of these attacks on the part of the public? While the people of this country realize intuitively the great contribution petroleum makes to their lives, they are confused and without answers when exposed to the groundless charges of demagogues.

This is the key to our industry's public relations program—now and in the future. We must not leave the public uninformed concerning matters that so vitally affect their security and well-being.

Yet the public relations staffs of our oil companies and industry organizations cannot carry out this assignment alone. We must impress upon every oil man—producer, refiner, transporter, jobber, distributor, dealer—that now is the time we must have his active help. Not just to read, but to write—to editors, columnists, TV and radio commentators. Not just to hear, but to speak—to business friends, neighbors, civic and social groups, to anyone who will listen. And what should we tell these people? Simply the truth—the facts of each issue as it arises.

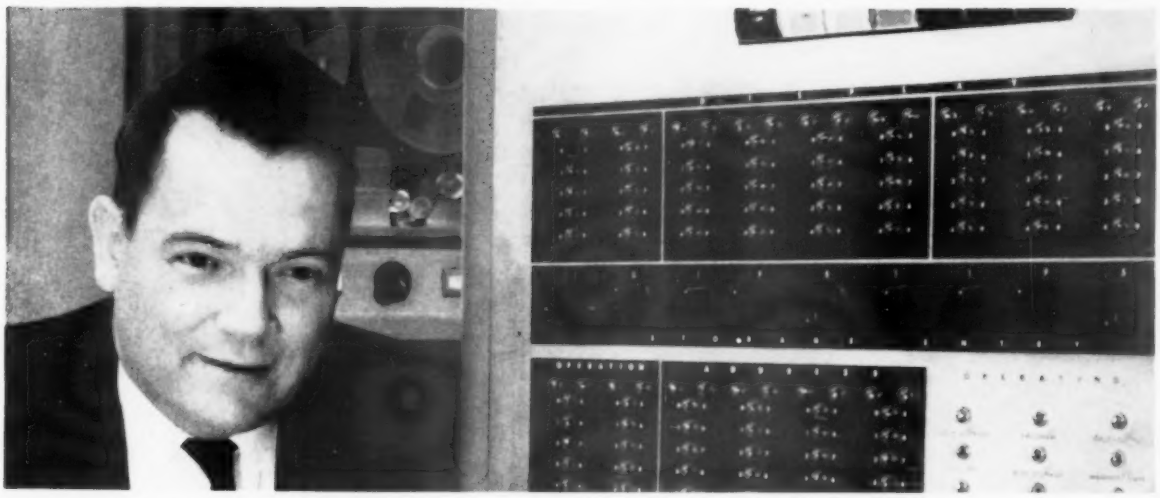
Will we succeed? Will we make the vital "breakthrough" in public understanding? I am confident that in time we will.

Let us remember that in the realm of ideas—no less than in war—the best defense is a strong offense. While we must continue to answer unwarranted attacks, to correct misinformation, and to advocate our own points of view, we must also find new and better ways to take the initiative with positive, constructive ideas.

Rather than wait to be told what is wrong with our traditional values, let us proclaim what is right with them. For every demand to tear down and destroy, let us propose to build and improve. This is the language the American people understand. This is the principle on which American industry operates. This is the message that oil men must express in ideas and translate into deeds.

MANAGEMENT

JONES Sees Electronics as a Business Way of Life



C. M. Jones, Manager, Data Processing, Shell Oil Co.

Companywide functions will be integrated . . . Better hardware is on the way . . . Executives will 'manage by exception.'

THE PETROLEUM INDUSTRY was one of the first to use electronic digital computers. Real implementation within most oil companies, however, has come largely within the past five years, as organizational relationships of the information-handling group have been formalized. The next five years undoubtedly will clearly mark this function as basic in the petroleum and other industries.

The science of information-handling embraces five areas: electronic computation, data processing, operations research, information storage and retrieval, and process control. These approaches will help to unify the basic functions of production, refining, marketing, distribution, and finance by integrating plans and procedures among these areas. We will thus be able to emphasize the whole rather than the part. The processing of material and the processing of data may be merged into one continuous area of activity.

There will be substantial technical improvements in equipment over the next five to ten years. Miniaturization of present large equipment is already under way. The transistor is the first step. Its successors may produce high-speed computers the size of office desks. The size of their memories, or storage capacities, will increase tremendously. It will be possible to store within them details of large sections of company operations, to be manipulated and retrieved according to special needs.

One of the present drawbacks to maximum utilization of the jet-speed computational abilities of computers is the horse-and-buggy speed of input and output. The breakthrough here certainly is imminent. Among the chief signs of progress are really high-speed printers, visual character-recognition, and the integration of communication facilities, enabling data originating at source points to be funneled directly into the computer.

For the petroleum industry, such developments would permit building up data banks from basic industry source documents, such as the run ticket, the credit card, and the purchase order.

As these machines become more accomplished, their use will be made easier, rather than more difficult. "Programming," or instructing the machines, will become less complicated. Generalized routines will be developed for maintaining files, generating reports, sorting numbers, selecting items of information, and directing the machine through a series of operations. The part-time users, the nonspecialists, will find working with these machines simplified.

Operation and control of the most complex petroleum processing functions are anticipated. It is already being shown that the computer can modify processes continually to produce optimum output.

Use of information-handling concepts and techniques will give greater emphasis to the "management by exception" concept. Reports to management will deal largely with deviations from the norm and with action dictated thereby.

Eventually, it is entirely possible that computers will be able not only to "read" handwritten and printed instructions, but also to "understand" vocal instructions. Further, machines able to modify their decisions and improve their performance as a result of experience are confidently predicted by scientists.

continued ▸

SPECIAL REPORT **CENTENNIAL FORECAST**

(continued)

Computers Won't 'Manage'—REEVES

Electronics will take over many executive functions, but never supply leadership.

E. Duer Reeves
Executive Vice-President, Esso Standard Oil Co.

OUR EXPANDING TECHNOLOGY, and one of its more dramatic developments, the electronic computers, are going to change oil management more than we would have guessed only a short time ago.

What actually will happen to our managers? Will they disappear, or what? Will management have anything left to do, or will it become a victim of technological unemployment? The concern of anyone who raises such questions is based on a general thesis along these lines:

> *The major responsibility of management is to gather facts, draw logical conclusions from these facts, and then initiate actions generated by the conclusions. This is something any good electronic computer could do, once we equip it with the right memory, an appropriate program, and a suitable feedback system.*

If these assumptions were all accepted, you can see that most of our management people might soon be out of work.

But they won't be.

For the sake of illustration, assume we have a machine shop requiring the services of 15 machine-operators and one foreman. We can be proud of the shop because the 15 men and their machines are doing the work of 1,500 persons in times past. Before long, we may be able to convert the machine shop so that it requires only the foreman, and convert the 15 machine-operators into 15 foremen. This would let us, in time, build 15 new-style machine shops, run by computers, and achieve another 15-fold increase in productivity. Each of the new shops would run itself and turn out all sorts of parts to satisfy inventory requirements.

But what are the parts for? Where will the raw material come from? Who wants the gadget the parts go into? How will it be used? How about the foreman? Does he know what to do if the machines get sick? At every turn we need decisions that the machine shop and its computer cannot imagine and cannot cope with.

All of these are management problems. Somewhere in our scheme of things, men must have imagination to plan, to organize, to coordinate, to direct the destiny of our technological production units and guide the men who devise their memory.

Just as we can devise production machines that create management problems, we can also devise machines that can help our managers cope with them. Normal management responsibilities of planning, organizing, coordinating, and guiding are complicated at best by the difficulty of assembling and digesting the various pieces of information on which management action is based. This is the job today of what we call management staffs. Tomorrow, however, the growth of staff groups, even if we expand them as fast as we can, simply will not take care of the problem. This again is a job for the machines, and, as you have heard, it is one they can do admirably. The computers and information-retrieval systems will form a superstaff.

How do you tell when the machines stop and management takes over? The answer, I think, is simple. The province of the machines is the past. They can remember, they can compute established relationships, and they can do it all with incredible speed. But their only knowledge of the future is the mirror image of the past. The province of management is the future, the development of new facts, new relationships, and new objectives. The difference is called imagination, or curiosity, or determination, or leadership.

Our future managers will be faced with essentially the same management problems they deal with today, but the job will be more complex, the challenge far greater, the need for those who can meet the challenge more urgent.

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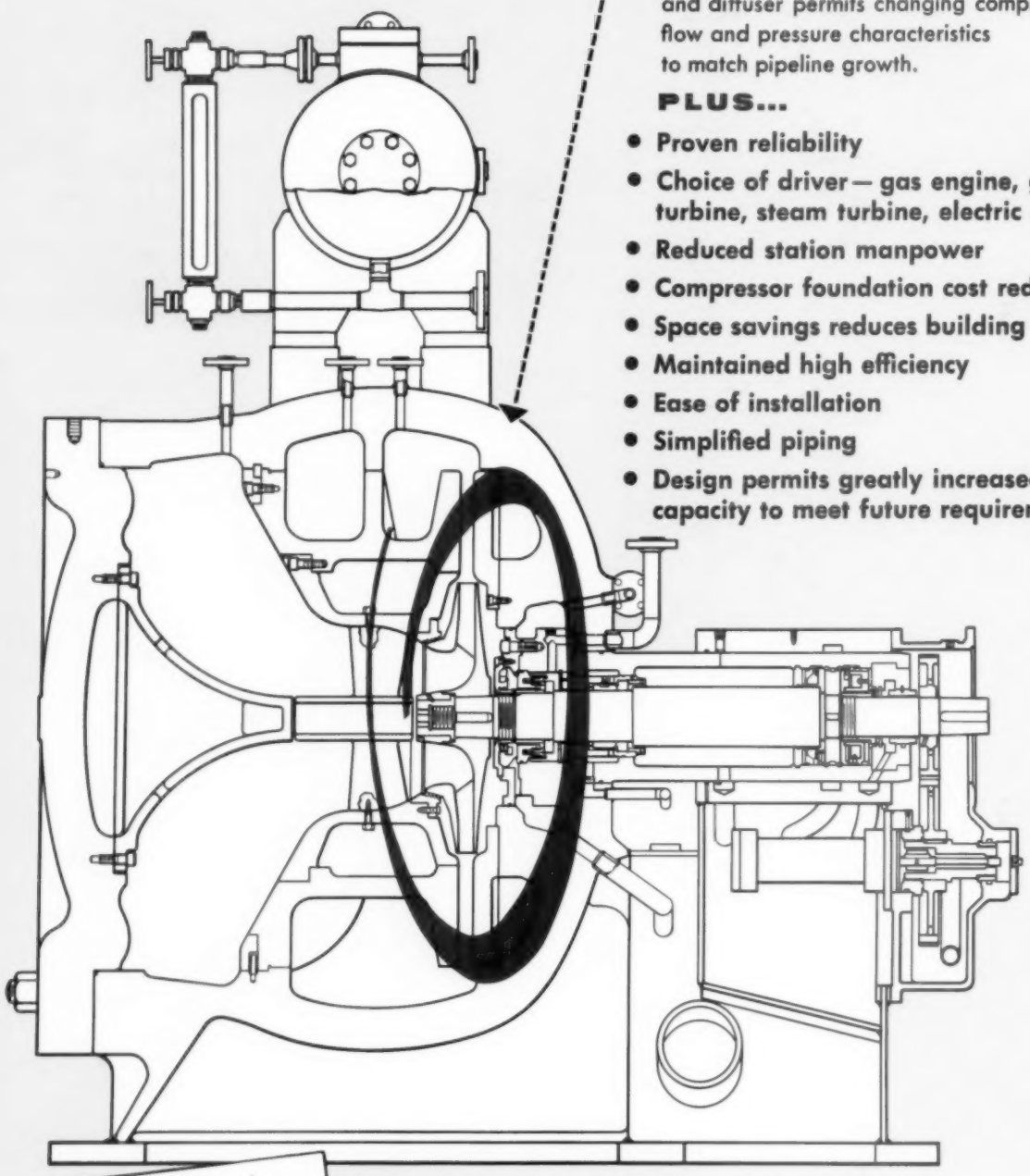

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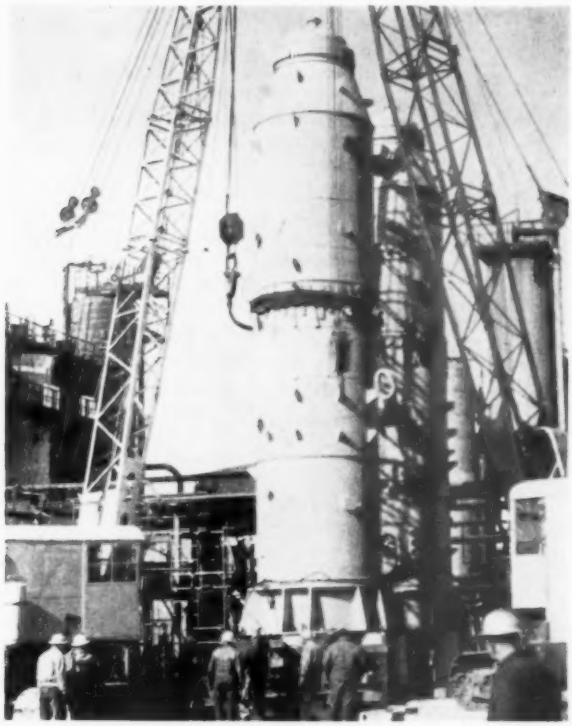

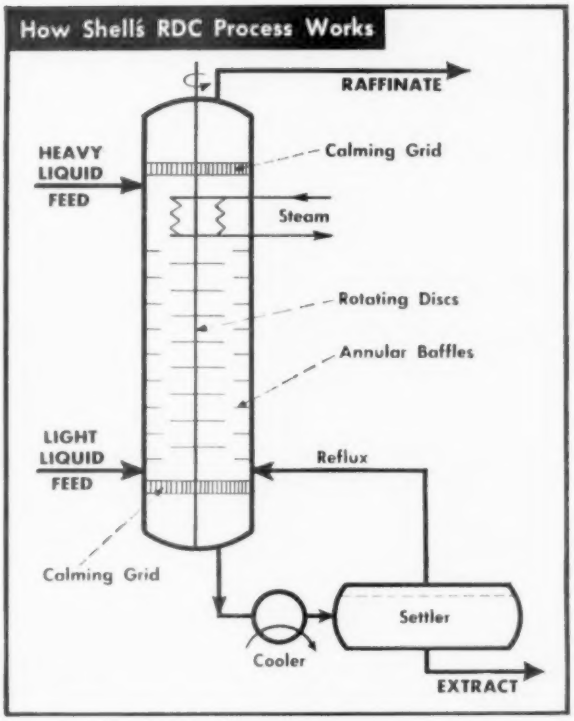

First RDC Lube Extractor Goes on Line

Rotating Disc Contactors, popular in Europe for many years as a means of extracting one liquid from a mixture, are now entering the field of oil refining in the United States.

One of the first installations of commercial size in a U.S. refinery is at the new Wood River (Ill.) lube oil plant of Shell Oil Co., where it is used in a deasphalting process.

Scheduled to go on stream this month, the Wood River plant will produce about 4,000 b/d of high-viscosity-index lubricant.

The RDC deasphalting unit will process about 2,700 b/d of residuum from a vacuum fractionating tower, to make 2,040 b/d of deasphalted oil and 660 b/d of asphalt.

RDCs were developed by Royal Dutch Shell Laboratories, in Holland and Great Britain, essentially for lube oil extraction. They were first brought to the United States in 1952, but up to now have been used commercially primarily in various chemical operations. About 30 RDC units are in operation in this country.

They are used for phenol extracting of waste liquors, mostly in the coal derivatives industry; they remove caffein in the making of caffein-free instant coffee (actually all the "aromatics" from the coffee are separated, the caffein is extracted, and the aromatics are returned to the coffee); they recover metals from solutions; and they have many other applications in the general extraction field.

Texaco has been licensed by Shell to use RDCs in connection with furfural extraction. The Turbomixer Division of General American Transportation Corp. has the exclusive license for application of RDC except in the petroleum industry, and nonexclusive in petroleum. The Lummus Co. is licensed on a nonexclusive basis for construction of RDC in the petroleum industry.

Several pilot plants have been built by U.S. refiners to study potential applications of RDCs, and many commercial-size installations are predicted in the near future.

Among the applications now being tested are the sweetening of gasoline, the preparation of cat-cracker feed stock, the recovery of aromatics from catalytic reformates, the caustic washing of organic compounds, the purification of synthetic detergent solutions.

The Rotary Disc Contactor is essentially a vertical cylindrical shell divided into a large number of compartments by a series of flat annular baffles (diagram, above). A rotating disc, smaller than the opening in the baffle, is centered in each compartment. The discs are mounted on a motor-driven rotating shaft.

Near the top of the shell is the inlet for heavy-liquid feed (for example, the residuum), arranged so that the liquid enters tangentially, in the direction of rotation of the discs. Near the bottom of the shell, also entering tangentially, is the feed of lighter liquid (for example, the solvent).

The heavy liquid flows downward and the lighter liquid moves upward, under a pressure which may range from atmospheric to 600 psi, according to the nature of the liquid being treated.

As the discs rotate, at speeds varying, with the products, from 10 to 500 rpm., the two liquids are gently and very thoroughly mixed. There lies the heart of the RDC process: the combination of a slow centrifugal motion of one portion of the liquid, and a slow motion of another portion of the liquid toward the center, plus a rotating motion. This improves markedly the reduction of one of the liquid

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phases to a high state of droplet dispersion.

"Calming grids" keep the liquid quiet in the top and bottom settling portions of the shell.

A steam coil is installed in the upper part of the contactor to keep a constant temperature, determined by the nature of the product being treated.

Means of recovering the solvent from the two separated phases (for example, the lube oil and the asphalt) are provided on the two streams of effluent liquids, in the form of settlers, refluxing circuits, or auxiliary treatment processes.

The Shell Wood River installation uses propane as deasphalting solvent. The two RDC shells, each 8 ft. in diameter and 40 ft. high, operate in parallel. The pressure is 475 psi., the maximum temperature is 170F. The 20 rotating discs turn at from 10 to 50 rpm. Total propane used is 200,000 lb. per hour.

Propane and deasphalted oil leave the top of the shells at 170F, while asphalt and propane leave the bottom at about 110F.

From the RDC plant, the oil, still containing some propane, goes to a phenol aromatic-extraction plant, then to a propane dewaxing installation. From there, the propane is recycled to the contactor.

Shell says RDC has several advantages over other types of extraction apparatus, such as packed columns or mixer-settlers.

Among the claimed advantages: an appreciable reduction in the size and the power consumption of the equipment needed for a specific operation; a great increase in efficiency of extraction; a great flexibility of contactor capacity with optimum efficiency maintained; the possibility of quickly changing from one feed-stock to another; and the tolerance of the RDC columns for solids.

Extensive tests run in the Shell laboratories have established the following facts about lube oil extraction, Shell says:

Regardless of the solvent ratio used, seven stages of separation are the maximum that can be economically applied to conventional extraction by multistage mixer-settlers (which are more efficient and more flexible than packed columns, even those 100 ft. high).

The same work can be done with an RDC unit 24 ft. high and 6½ ft. in diameter having 16 compartments, which will cost less than half of a mixer-settler system. Furthermore the unavoidable solvent losses are reduced by about 30%, and considerably less power will be required.

Do-It-Yourself Hydraulic Fluid

ciety of Lubrication Engineers, in Buffalo. Furthermore, says McDonald, the problem of leakage is always serious

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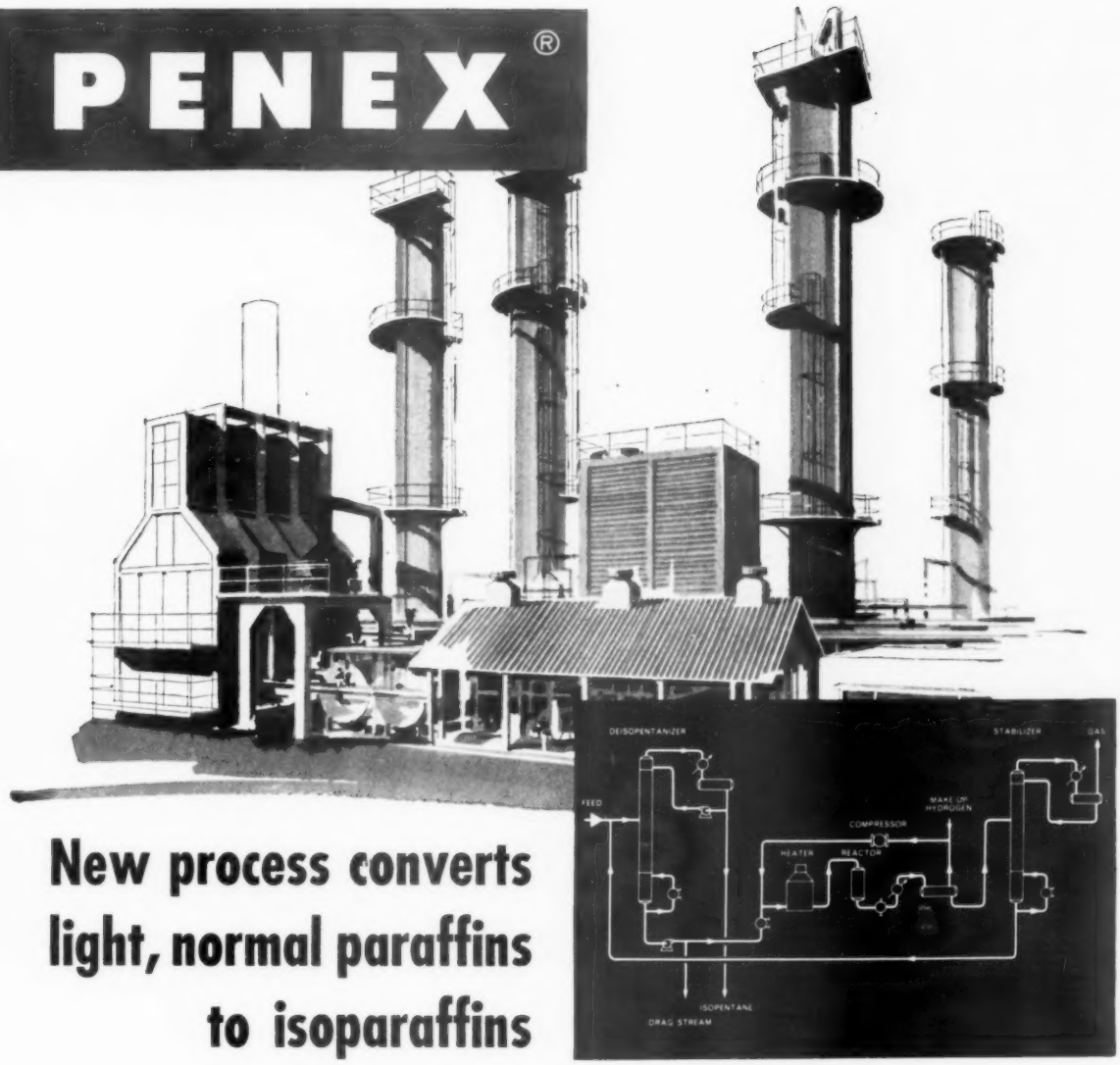

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Do-It-Yourself Hydraulic Fluid

A water-emulsion-type, petroleum-base hydraulic fluid, which can be used with no fire hazard, and which can be mixed at the point of use, has been developed by Shell Oil Co.

The new product, known as Shell 3XF Mine Fluid, was put on the market this week. It is intended specifically for use in mine equipment, such as cutting, loading, and drilling machines, and shuttle cars, and many other types of hydraulically operated equipment.

The emulsion is prepared on the spot—for example, in an ordinary 55-gallon oil drum—by slowly adding 10 gal. of clean drinking water to 15 gal. of the concentrate, while agitating the mixture with compressed air. Agitation must be carried on for at least one hour, to obtain a good "water-in-oil" emulsion. Such an emulsion will keep for weeks, providing it does not freeze.

The danger of fire when petroleum-base hydraulic fluid is used in a mine, a steel mill, a foundry, a die-casting plant, a plastic factory, has always been serious. Many cases of costly fires are on record.

Whenever open flames, sparks, high-temperature metals, or plastics are involved in the operation, there is always a possibility that a hose may tear, or a joint may start leaking, and highly flammable oil, under pressure, will cause a severe and costly accident.

That is why, in the past few years, refiners have put on the market several kinds of fire-resistant hydraulic fluids.

These can be of three general types.

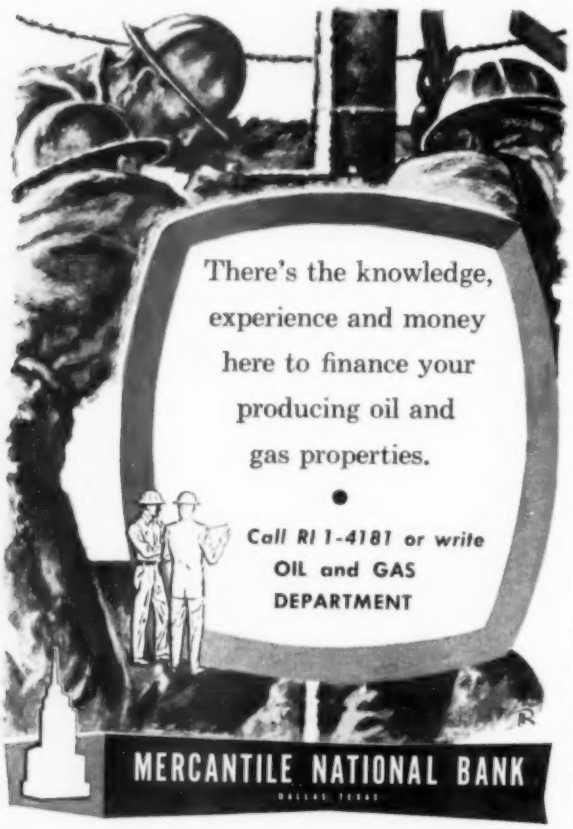
(1) The "synthetic" or "nonaqueous" fluids, which may be a phosphate ester, a chlorinated hydrocarbon, or some similar mixture of chemicals. These synthetic hydraulic fluids have a high ignition point, and therefore are very safe. They have good lubrication quality, are stable, and work in systems under pressures as high as 5,000 psi. They operate best at temperatures of 120F to 150F, but localized spots as hot as 300F have no adverse effect.

However, the packings, seals, gaskets, and hoses usually installed for a petroleum-base hydraulic fluid system are not satisfactory with most of the synthetics, according to L. R. McDonald, of Wheeling Steel Co., who discussed fire-resistant fluids at the recent meeting of the American Society of Lubrication Engineers, in Buffalo. Furthermore, says McDonald, the problem of leakage is always serious when dealing with a fluid which costs seven times as much as a conventional petroleum-base fluid.

(2) "Water-base" fluids, made with water, glycol, or polyglycol, a thickening agent, and rust and wear inhibitors. These are less expensive than the synthetics, and can be used in medium-pressure systems, from 500 to 2,500 psi.

These were the original groups of fluids developed for fire-resistant applications. They work satisfactorily up to 150F, do not stand localized temperatures much above that figure, McDonald points out. They are corrosive to zinc and cadmium, which may be present in the system in the form of galvanized piping, strainers, or gauges. When cellulose-fiber filters are used with these fluids, they must be cloth-covered to prevent disintegration. The water content of these fluids must be periodically checked, as their fire-resistant quality depends upon proper water percentage.

(3) "Water-oil emulsions," which are a relatively recent development. These may be either "oil-in-water" emulsions—similar to cutting fluids, but with a higher oil content—or "water-in-oil" emulsions. In the latter, the small water droplets in emulsion in the oil instantaneously expand into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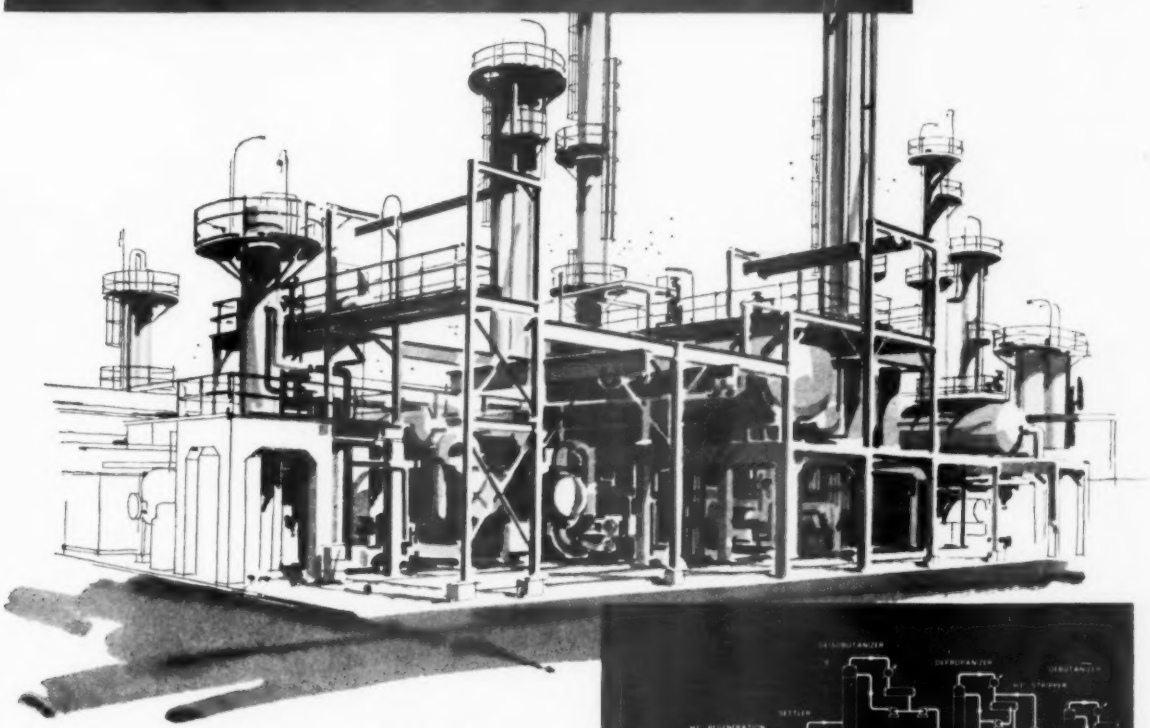

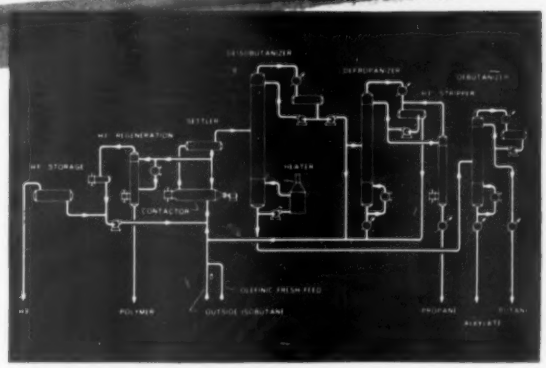

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"HF" Alkylation is a catalytic process which combines olefins such as propylene, butylenes and amylenes with isoparaffin (usually isobutane) to form a mixture of branched chain hydrocarbons of higher molecular weight known as alkylate. "HF" Alkylation is also widely used for producing high octane aviation gasoline.

Motor alkylate, an isoparaffin fuel component, burns with a minimum of carbon deposits even in today's modern high compression automobile engines and thus greatly reduces surface ignition and its consequent "rumble."

Another method for producing alkylate is also available to refiners through UOP. It is similar to the "HF" method but uses sulfuric acid as the catalyst. This process is licensed by Universal Oil Products Company under their own patent rights and the patent rights of Shell Oil Company, The Texas Company, The British Petroleum Company, Limited and Standard Oil Company of New Jersey.

These processes for producing alkylate afford further evidence of UOP's policy of providing the refining industry with every means for a well-rounded, profitable manufacturing operation.

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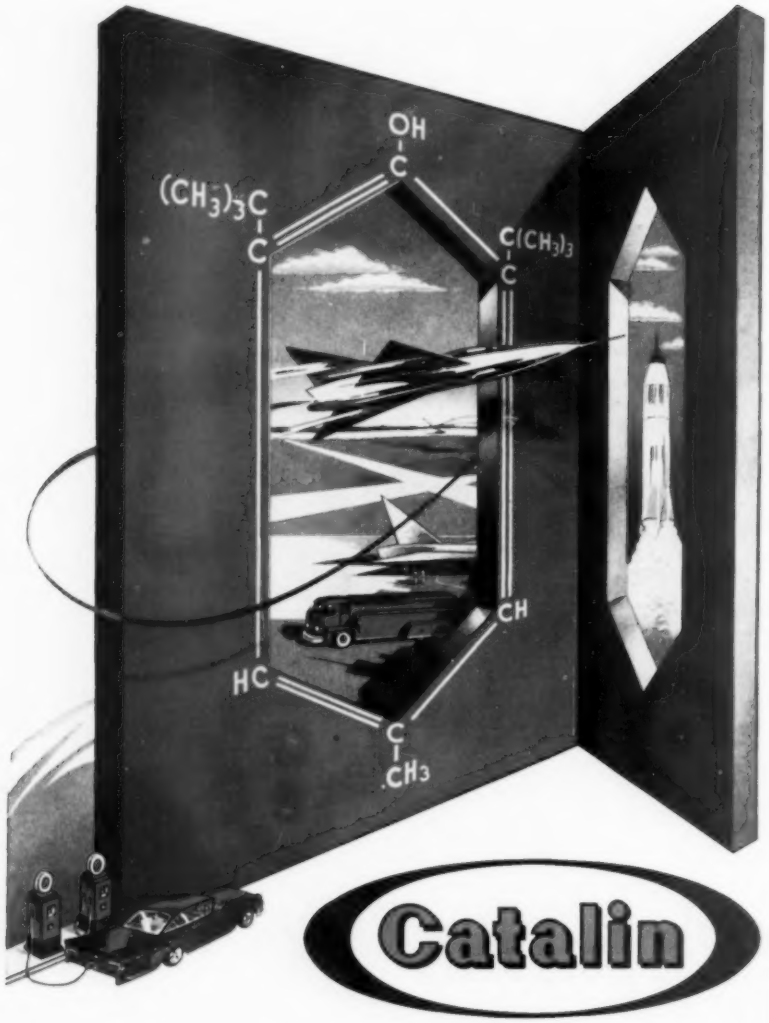
NEWS ON TEXACO PROGRESS



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Catalin ANTIOXIDANT CAO-1 stabilizes high-octane automotive gasolines, as well as turbine, insulating, hydraulic and transformer oils . . . in fact, nearly any petroleum hydrocarbon exposed to oxidizing conditions.

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*Typical Analysis

"water-in-oil" emulsions. In the latter, the small water droplets in emulsion in the oil instantaneously expand into steam when overheated, and "blanket" the fire. They have a "snuffing" action.

These emulsions operate at pressures up to 2,000 psi., and at temperatures not over 150F. The tendency for the water to separate out of emulsion can be remedied by maintaining a good agitation within the system. Pumps and filters must be periodically checked with these fluids.

In view of the difficulty of preparing satisfactory emulsions on the spot, fire-resistant fluids containing as much as 40% of water have been sold, at prices much higher than conventional hydraulic fluids. Since the Shell fluid is a concentrate, its cost will be somewhat lower.

The Shell fluid contains the necessary emulsifying agents to make a "water-in-oil" emulsion. But it requires the "shearing" action of the first cycle of circulation in the machine to acquire good stability.

Why start with the mines? Because, say the Shell engineers, hydraulic fluids in mines are generally subjected to less severe requirements than in other industries.

Derby Completes Its Modernization

This month, at the Wichita (Kan.) plant of Derby Refining Co., a 1,700-bbl. hydrofluoric acid alkylation unit is going on the line. This is the final step of a modernization and expansion program which started in 1957.

W. C. Norman, president of Colorado Oil & Gas Corp., the parent firm, says this multimillion-dollar program has eliminated bottlenecks in several existing units, and has given the Derby refinery the needed flexibility to balance sales and production.

The plant will be able to produce either high or low yields of jet fuel, fuel oils, and diesel fuels, as well as high-octane motor fuel of improved quality.

The planning and designing was done by Derby's engineers, assisted by Socony Mobil Oil Co. and Litwin Engineering Co., of Wichita.

The conversion was accomplished in several major steps, all concentrated around the existing Thermofor cat cracking unit.

These included the installation of a new Born heater with 25-million-Btu. capacity; enlargement of the liquid feed lines from the bottom of the flash tower to the reactor to re-

duce back-pressure; replacement of existing pumps with 13 new Ingersoll-

TCC unit, but also of the gas concentration plant and the catalytic

NEWS ON TEXACO PROGRESS

Two views of progress . . . 57 years apart

YESTERDAY. Texaco's first refinery at Port Arthur came into being in 1902 to turn the black crude oil — newly discovered in quantity — into useful products for mankind. Produced in simple stills, the first products were kerosine, naphtha, asphalt and primitive lubricants.

TODAY. At Port Arthur, and at 11 other major Texaco refineries in the United States, ultra-modern chemical wizardry uses many methods to produce constantly improved gasolines, perfected lubricants, and a myriad of other petroleum products. Because these products are so vastly improved, you can drive a more powerful car — jet planes can fly faster and farther — industry can operate more efficiently. And because it has constantly planned ahead, Texaco's growth has been continuous.

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IN OIL'S FIRST CENTURY

. . . . Demanded by the Petroleum Industry

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duce back-pressure; replacement of existing pumps with 13 new Ingersoll-Rand hot oil and feed pumps; installation of an 1,100-hp. Elliott steam turbine; addition of new heat exchangers and coolers along with increased steam generating equipment; addition of a new 600-hp. Worthington gas-engine-driven compressor, with an increase in size and quantity of gas lines.

These changes not only increased the capacity and flexibility of the TCC unit, but also of the gas concentration plant and the catalytic polymerization unit.

The design of the plant's original TCC unit was for 4,000 b/d at 50% conversion. The modernized unit has a capacity rating of 7,335 b/d of fresh feed at 76% conversion, or 9,200 b/d at 66% conversion.

The new alkylation unit which will complete the present program was licensed by Universal Oil Products Co. and installed by Procon, Inc.

What's New / IN PROCESSING

Texas Eastman Co. is boosting polyethylene capacity at its Longview (Tex.) plant from 85-million to 100-million lb. a year. Texas Eastman first put the plant into operation in 1952 with the production of ethyl alcohol, normal butyraldehyde, and iso-butyraldehyde.

•

American Oil Co. plans a $268,000 program to reduce pollution of streams by its El Dorado (Ark.) refinery.

At a hearing of the Arkansas Water Pollution Control Commission, a company spokesman said that the refinery has two sources of pollution: chemicals used in processes at the plant, and oil wastes.

Detailed plans for the program include improved coke separation equipment for the plant, and the collection and sale of caustic that is now discharged in the refinery effluent.

•

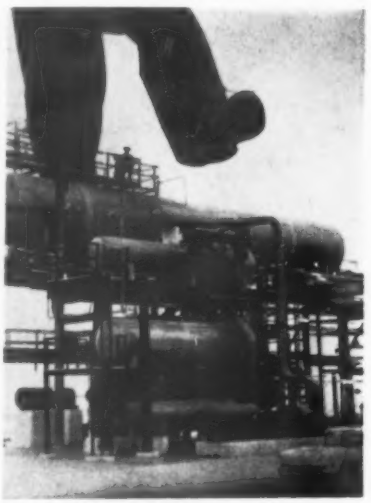
Scientific Design Co. Inc. has been awarded three new contracts for ethylene oxide plants in Europe: Erdoelchemie GmbH, Dormagen, Germany; Societe Chimique des Derives du Petrole, Antwerp, Belgium; and Naphtachimie, Lavera, France. Four other SD ethylene oxide plant projects have just gone on stream, within a 30-day period, one in Texas, and three in Europe.

•

Engineering

A new end-point analyzer, developed by Technical Oil Tool Corp., was unveiled at the Tulsa Oil Show this week. The unit continuously and automatically indicates the end boiling point of any hydrocarbon stock with an end point range of 200F to 600F.

The new analyzer, which weighs only 200 lb., consists of four main components: a boiling pot with constant heat input, a fractionating tower packed with Berl saddles, a pneumatic pressure control system, and a temperature-sensing unit.



Model Way to Build

This is neither a refinery engineer's nightmare nor a Gulliver in modern dress, but a junior version of a new processing unit at Sun Oil Co.'s Toledo (Ohio) refinery. The model took ten weeks to build the real unit took nine months. But it would have taken much longer, Sun says, if designers had not built the miniature first. Such wooden and plastic models of processing installations are being used in increasing quantities for the planning and development of refinery apparatus.

....Demanded by the Petroleum Industry

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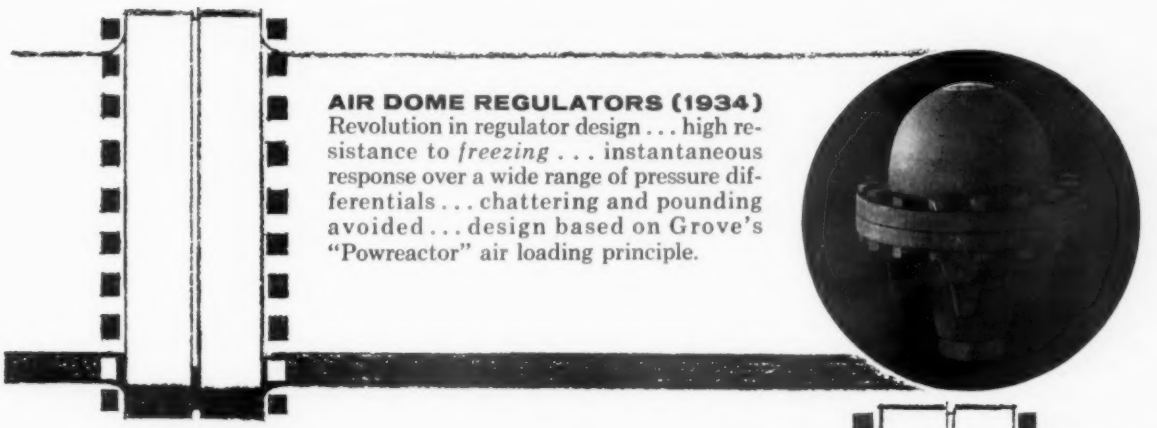
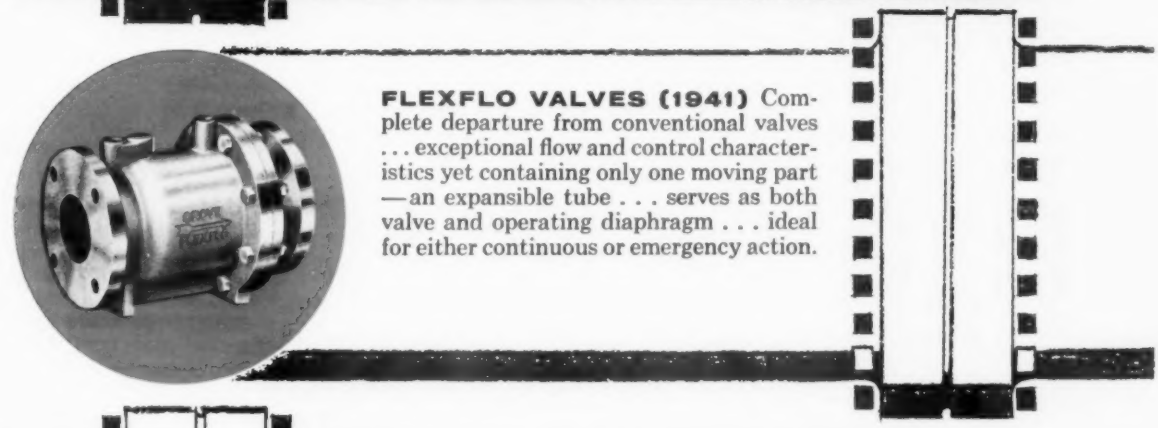
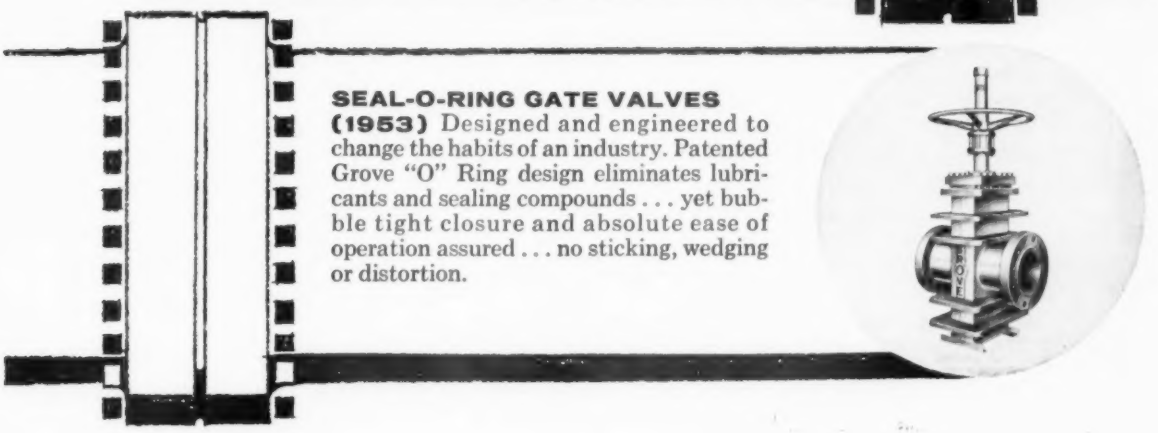


AIR DOME REGULATORS (1934) Revolution in regulator design . . . high resistance to *freezing* . . . instantaneous response over a wide range of pressure differentials . . . chattering and pounding avoided . . . design based on Grove's "Powreactor" air loading principle.



FLEXFLO VALVES (1941) Complete departure from conventional valves . . . exceptional flow and control characteristics yet containing only one moving part —an expansible tube . . . serves as both valve and operating diaphragm . . . ideal for either continuous or emergency action.



SEAL-O-RING GATE VALVES (1953) Designed and engineered to change the habits of an industry. Patented Grove "O" Ring design eliminates lubricants and sealing compounds . . . yet bubble tight closure and absolute ease of operation assured . . . no sticking, wedging or distortion.

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DEPT/Marketing

Oil Rebuts Detroit's Economy Claims

The oil industry is waging a vigorous campaign against Detroit's oil and gasoline economy claims.

The American Petroleum Institute, Esso Standard Oil Co., Mobil Oil Co., Shell Oil Co., and Gulf Oil Corp., among others, have disputed the claims of car manufacturers that many of their new cars don't need premium fuels or every-1,000-miles oil changes.

The outcome of the argument is important to all oil companies because of the effect on lube oil sales. The average motorist today drives almost 3,000 mi, before changing his oil, causing lube sales to lag behind gasoline sales (PW—Jan.30,'59,p44).

Last week, API reported its findings of tests performed on 81 taxicabs. API concluded that the maximum performance of motor oil and oil filter is lost if oil-change intervals are extended excessively.

Countering the advertising claims that have led, in some cases, to crankcase drain recommendations ranging up to 5,000 mi., API warns that serious questions were raised by the taxicab study regarding the ability of some high-quality detergent additives to control sludge during long drain periods.

Mobil Oil Co. insists that the 1,000-mi. oil change is the only answer to excessive contamination of engine lubricants, despite claims by Detroit that today's new cars are built to withstand engine wear without frequent oil changes.

Mobil points out that today's powerful cars often do not heat up sufficiently to prevent contamination of crankcase lubes with raw, unburned fuel.

Even though contaminated lubricants do not immediately produce noticeable malfunctions—such as engine knock and hard starting—they can produce considerable engine wear and reduce efficiency, Mobil says.

Gulf Oil Corp., in test results released earlier this year, concurs with Mobil on the subject of the 1,000-mi. oil change. Gulf said its tests showed that motorists who change their lubes every 2,500 mi. suffer twice as much wear on piston rings than motorists who follow the prescribed 1,000-mi. changes.

Gulf also says that, when cars fail to warm up properly, engine operating temperatures generally are not sufficiently high to prevent acidic solutions from condensing on cylinder walls and accumulating in the crankcase oil.

In disputing the claims of auto makers that many of their cars do not require premium fuels, Esso Standard Oil Co. says that a great many of the new cars—even among the lower-priced models—will not operate satisfactorily on even the best grade of regular fuel.

Studies by Esso's engineers and by outside technical organizations reveal, Esso says, that auto manufacturers' claims that their cars operate satisfactorily on regular-grade fuels are not correct. Esso notes that the car manufacturers base their recommendations on the results of many technological and styling changes that supposedly reduce the quality-fuel requirements of 1959 models.

Some of the economy measures introduced by car makers include smaller engines, transmission changes, carburetor refinements, dual exhaust systems, changes in rear-axle ratios, valve and distributor timing improvements, and streamlined air-flow around the automobile's body.

But, Esso says, its tests reveal that these measures have not reduced the need of many 1959 cars for top-grade gasoline.

Shell Oil Co. reports that even some new-car dealers reject Detroit's economy claims.

In a survey of 34 California service managers employed by new-car dealers, Shell found that the managers generally recommended 1,000-mi. motor oil drain intervals, multigrade lubricants, and premium-grade gasolines for today's new cars.

"Some service managers," Shell says, "go so far as to obliterate the manufacturer's recommendation in the owner's manual and stamp in its place: '1,000-mi. drains recommended.'"

Moreover, Shell found that "an overwhelming majority of the service managers recommend that their customers use premium-grade gasoline."

Rush to Market Research Slows

The trend toward the establishment of separate market research departments in major oil companies has apparently slackened.

After the remarkable rush to form market research departments during the middle 1950s, only two oil companies have taken this step in the past two years. And one company that had such a department discontinued it last year.

These findings were revealed in a survey of 30 major oil companies, which was completed this week by PETROLEUM WEEK.

The big years for the establishment of market research departments in oil companies were 1955 and 1956. Of the 30 companies surveyed, 18 now have market research departments. Six of these were formed during these two years. Since then, only three have been formed.

The size of most market research departments has remained small—less than 12 employees—with only a few oil companies increasing the size of their staffs.

Of the 18 companies with separate departments, eight companies staff their departments with eight or fewer employees. Five companies have held the size of their departments to two or three employees.

About half of the oil companies with such departments have added to their market research staffs in the past two years, but the average increase has been less than three employees. And many companies have found that their need for market research employees is not great enough to warrant an entire staff of full-time members.

The use of outside market research agencies appears to be quite widespread, even among oil companies that have their own departments.

All but two of the companies with market research departments report that they make some use of outside consulting firms. One East Coast oil company reports that between 75% and 90% of its market research budget was spent to hire the services of outside firms.

But this company is exceptional. Most oil companies spend between 10% and 30% of their MR budgets on outside firms, with a few companies splitting their expenditures 50-50.

In practically every case where a market research department exists, it is directed by a "manager" or "di-

rector" of market research. But in only seven companies does the head of market research report to a vice-president. Usually, the MR manager reports to a marketing manager or even a sales manager.

In one instance there is a vice-president in charge of marketing research. And in this company, the market research department reports directly to the president.

The training of market research directors in oil companies is steeped strongly in economics and research methods.

Many of the research directors served as market analysts within the marketing division before taking over as head of market research.

Most of the department directors have academic training in economics at the bachelor-degree level. Two companies reported that their directors had completed their masters', and two others indicated that their departments are directed by men with doctorate degrees.

There appears to be an absence of training in the social sciences, such as sociology, psychology, and anthropology, among market research directors. But the MR function in oil companies is characterized more by its economic studies than by its analysis of consumer motivations.

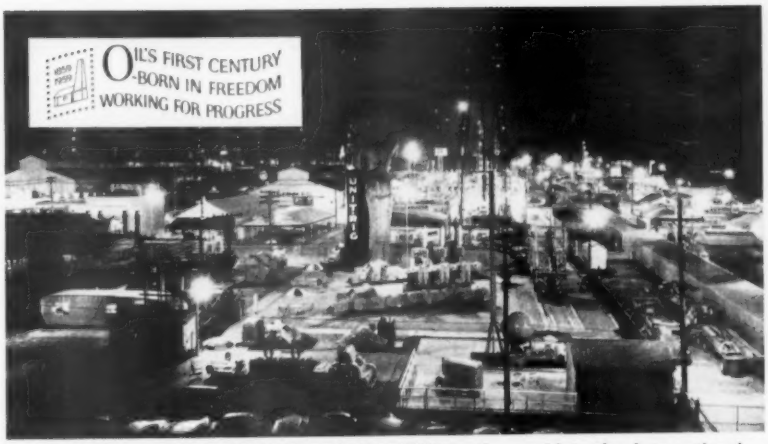
The most important problems on which market research departments have worked during the past year have been predominantly economic studies.

Many oil companies are concerned with improving their sales forecasting techniques. Six of the market research departments surveyed report that more accurate sales forecasting was among the three most important problems they dealt with during the past year. Other problems are the locating of new stations, and the study of the potential of new marketing areas.

Another predominant market research function is estimating the profitability of marketing operations. This includes such problems as the number of bulk stations needed to serve an area economically, the costs of servicing wholesale accounts, and the comparative profitability of marketing regions.

Another group of problems handled by the market research departments during the year involves the evaluation of advertising, merchandising, and corporate image.

Only three oil companies reported that they consider analysis of consumer motivation among the three most important problems that their market research departments had tackled during the year.



LARGEST SINGLE-INDUSTRY TRADE SHOW in the world is the International Petroleum Exposition, above, which will be held May 14-23 in Tulsa, Oil Capital of the World. And the largest integrated oil company headquartered in Tulsa is Sunray Mid-Continent Oil Co. One of the nation's top 150 industrial companies, this half-billion-dollar firm engages in exploring, producing, pipelining, refining and marketing oil in 19 states and abroad. D-X Sunray, a subsidiary, handles refining and marketing. Sunray and subsidiaries work 'round the clock to serve America, *aware that oil progress and America's progress go hand in hand.*

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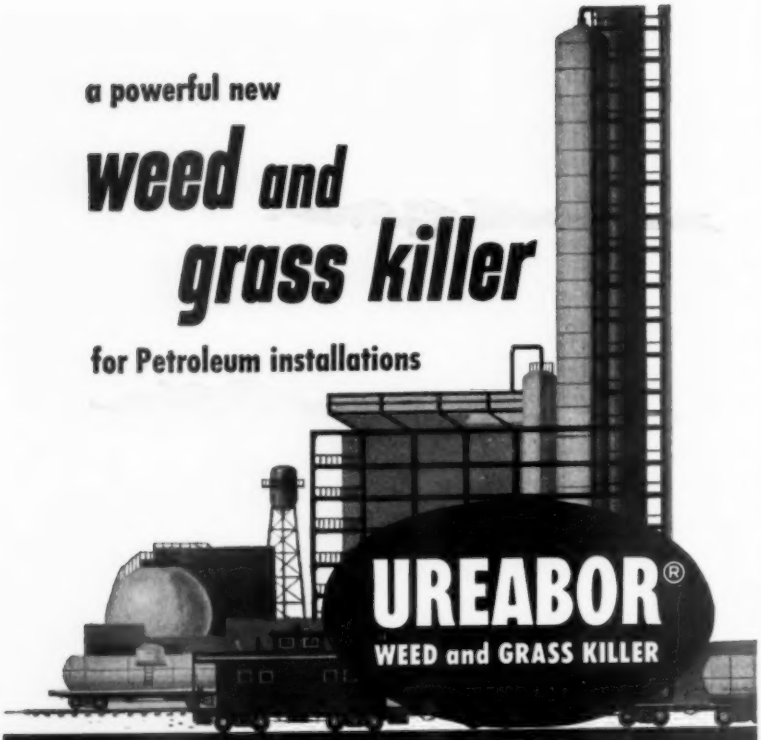

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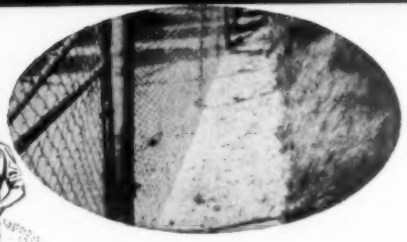

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What's New IN MARKETING

The investigation of oil marketing practices in the Denver area will be resumed by a federal grand jury on June 8.

The jury recessed its investigation Feb. 23 to permit government antitrust attorneys to study testimony and exhibits present during six days of hearings (PW—Mar.6'59,p55).

The investigation was prompted by a Denver price war that lasted for nearly two years.

•

Cities Service Co. has just finished an underground fueling system—reportedly the world's largest—for Eastern Air Lines at Miami International Airport.

Built for Eastern's mammoth airliners, the system will pump 11,000 gal. of aviation fuel a minute, cutting fueling time in half and eliminating the need for a large fleet of trucks.

•

A "super-regular" gasoline at regular prices is being offered by Speedway Petroleum Corp. in Michigan and other midwestern states. Its octane rating is 95.3, compared to the average rating for regular gasoline in the U.S. of 91.7 as reported by Ethyl Corp. for April. Average premium rating in April was 99.1.

•

A new concern—Insuratrip—is selling life and limb insurance to motorists at service stations.

In stations from the Southeast to as far north as Newark, N. J., motorists are dropping coins into special telephones and receiving in return insurance coverage for as much and as long as desired. A licensed insurance agent at the other end of the line takes down the particulars and sends a notice to the beneficiary.

The plan is underwritten by Carolina Casualty Insurance Co., of Jacksonville, Fla.

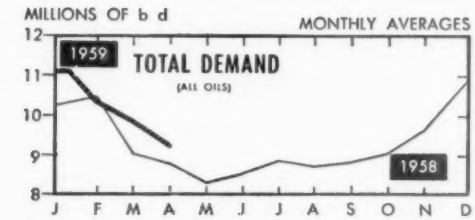
•

Bay Petroleum Corp. continues to expand in the South with the acquisition of Independent Oil Co.'s products terminal at Lynn Haven, Fla.

Bay, a division of Tennessee Gas Transmission Co., received an office building, warehouse, marine dock and truck loading facilities, storage tanks with a total capacity of 30,000 bbl., and a 16,000-bbl. barge.

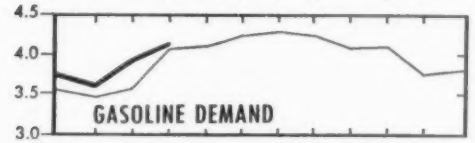
PETROLEUM WEEK'S

Fingertip Figures



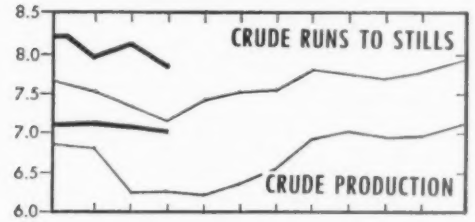
TOTAL DEMAND

Latest 4-week average	9.085
Year ago	8.674



GASOLINE DEMAND

Latest 4-week average	4.214
Year ago	4.108

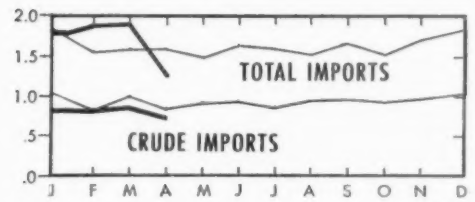


RUNS TO STILLS

Latest week	7.722
Previous week	7.702
Year ago	7.255

CRUDE PRODUCTION

Latest week	7.200
Previous week	7.113
Year ago	6.220

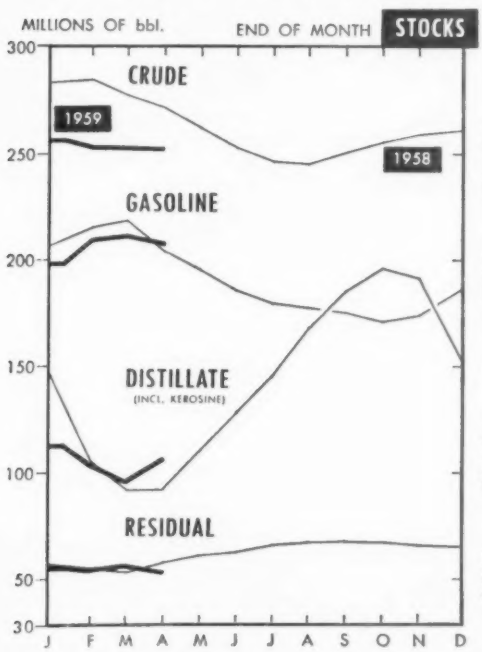


TOTAL IMPORTS

Latest week	1.374
Previous week	1.441
Year ago	1.630

CRUDE IMPORTS

Latest week	.828
Previous week	.929
Year ago	1.092



CRUDE STOCKS

Week-ended 5-2	255.0
Previous week	252.0
Year ago	276.3

GASOLINE

Latest week	209.5
Previous week	209.6
Year ago	201.2

DISTILLATES

Latest week	109.3
Previous week	106.6
Year ago	97.4

RESIDUAL

Latest week	55.6
Previous week	54.5
Year ago	59.1

Despite constant warning by many oil economists, the industry seems to pay little attention to seasonal fluctuations in demand—which can be predicted closely.

Demand for the latest four-week period, for example, is 2,260,000 b/d below the average for January.

And before the seasonal low point in demand is reached, the "spread" will be close to 3-million b/d.

But look at current supply statistics: Domestic production of crude and natural gas liquids averaged 8,050,000 b/d, just 35,000 b/d below January. Imports last week were 750,000 b/d below January, due to mandatory controls.

It's the lack of coordination of supply with demand that builds stocks up to the point where prices suffer.

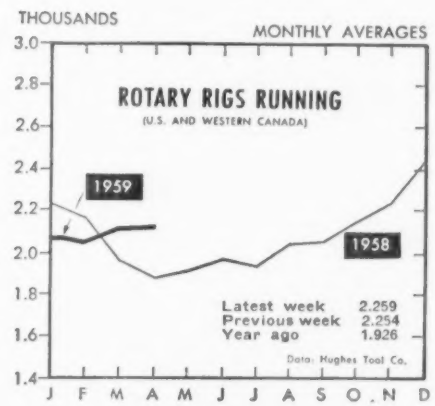
Refinery runs last week were 500,000 b/d under January but many economists say they should have been at least another 500,000 b/d lower.

The relatively high runs serve to keep crude inventories down, but result in high product inventories—along the lines of a "borrow from Peter to pay Paul" approach.

The domestic industry now has—and has had for some time—adequate producing, refining, and transportation capacity to cope with seasonal upturns in demand without maintaining high stocks in "off" periods.

Some accumulation of heating oils is needed in the summer to meet fall and winter demand. And likewise, a buildup in gasoline stocks is needed in the winter.

But the industry insists on an uneconomic accumulation of stocks the year-round, which penalizes everyone.



Latest week	2,259
Previous week	2,254
Year ago	1,926

Data: Hughes Tool Co.

The Market Trend

AT-A-GLANCE
Copyright
PETROLEUM WEEK

U.S. Flag Tanker Rates Come Up for Air

After a long dry spell, U. S.-flag shipowners are looking for a little rain. Spot ocean rates, they hope, will turn strong very soon.

U. S.-flag tanker rates have been touted for strength ever since mandatory oil import curbs went into effect in mid-March. The argument was that greater volumes of crude and products would be flowing from the Gulf Coast to the East Coast. So more tankers would be needed on this "protected" route. Therefore, U. S.-flag tanker rates ought to rise.

In actual practice, tanker rates took a nosedive from the word go on the oil imports curb. Clean rates for Gulf-New York trips fell from USMC—22½% in mid-March to a bottom of USMC—45% at the end of April. Dirty rates slumped in the same fashion. Tankers were waiting for cargoes for over a week at a time in the Gulf. Lay-ups increased.

Last week, however, there were hints of better things to come. Two majors came in the market for five Gulf-New York spot voyages. The military is expected to do some Persian Gulf chartering soon. About 2-million bbl. of black oils have been arranged for West Coast-to-East Coast hauls. There's an Indian requirement for grain (which tankers can handle much cheaper than dry cargo vessels) for U. S. to Bombay for May loading.

Rates for U. S.-flag ships actually started upward last week, but traders wonder how far the trend will develop. The uncertainty in the market is evident when two majors chartered out what they thought were surplus vessels last week, and then chartered in what they thought were valid requirements right afterward. It's a "stop-and-go" market.

Spot clean rates, Gulf-New York, rose from "—45%" to "—40%" to "—37½%," and the hope is that this surge will take the market up to USMC—30%. That's the equivalent of moving from "very bad" to "bad," but it's an improvement, nevertheless.

Looking back, the trouble with U. S.-flag tanker rates was the big cushion on foreign oil that was built up in the U. S. before the oil curbs. Even now, it doesn't look as if East Coast marketers will be buying much gasoline at the Gulf for a long time to come. Eastern terminal operators, also, may hold off from buying No. 2 at the Gulf until after June 1. And if Gulf Coast gasoline prices get high enough to interest refiners there, then West Coast gasoline buyers will retire from the scene.

At least, U. S.-flag tanker owners have one consolation: There is a logical and valid hope of higher freight rates to come. For foreign-flag tankers, nothing even remotely hopeful is on the horizon.

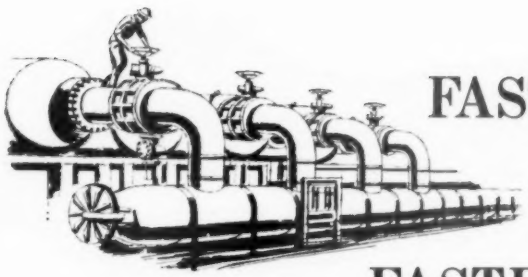
7c Gasoline To Donges, France:

The real shocker this week in the international market was a report that the military has negotiated a supply contract for 52-million gal. of combat gasoline (83/91) for delivery to Donges, France, at 7¢ a gal.

The supplier is reliably reported to be a refiner located in Puerto la Cruz, Venezuela. The military won't be much help here; it doesn't normally make public its negotiated oil contracts.

And 5c Gasoline In North Carolina:

Kannapolis, N. C., had the distinction last week of the lowest-priced gasoline in the nation—5.4¢ net for tank wagon deliveries to service stations.



FASTEST-GROWING FUEL in America's FASTEST-GROWING REGION

El Paso Natural Gas Company *reports record deliveries of Natural Gas to customers in the West*

Natural gas is America's fastest-growing energy source, and El Paso Natural Gas Company and its subsidiaries serve natural gas's fastest-growing market.

Deliveries of gas were at record highs in 1958 as El Paso and subsidiaries continued to expand their pipeline systems and increase their gas reserves to meet the long-term energy demands of the West.

For the second consecutive year, gas deliveries totalled more than a trillion cubic feet.

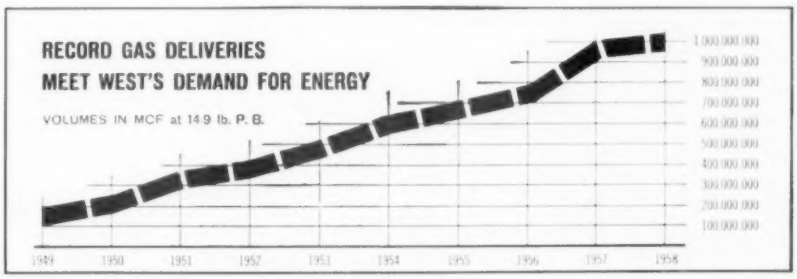
Extensive exploration and purchase programs brought total gas reserves at year's end to an all-time high of 38.8 trillion cubic feet—assuring vitally needed energy supplies for western consumers and industries in the years ahead.

El Paso's 1958 annual report, distributed to its 51,835 stockholders (an increase of 10 per cent in 1958) reports consolidated gross revenues for 1958 of $368,299,522, compared with 1957's $301,090,537. Net income was $35,308,813 in 1958, compared with $34,506,238 in 1957.

The report gives details of 1958's accomplishments, as well as plans to meet the future needs of western consumers—for natural gas, for petroleum, for petro-chemicals.

El Paso Natural Gas Company and its subsidiary, Pacific Northwest Pipeline Corporation, serve customers in California, West Texas, Arizona, Idaho, Nevada, New Mexico, Oregon, Utah, Washington, Wyoming and Colorado.

For copies of El Paso's 1958 Annual Report to Stockholders, write to El Paso Natural Gas Company, El Paso, Texas.



EL PASO NATURAL GAS COMPANY

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The Market Place AROUND THE WORLD

Prices compiled for PETROLEUM WEEK by Platt's OILGRAM Price Service and National Petroleum News, McGraw-Hill Publications

All prices as of May 11

Bold face type indicates changes from previous week

KEY PRICES—REFINED PRODUCTS

(¢ per gal. except dollars per bbl. where $ is shown)

Western Hemisphere

U. S. Gulf Coast, cargoes
- Gasoline, 98 oct prem....12-13
- Gasoline, 92 oct reg....10.75-11.5
- Kerosine....9.5-10.375
- Heating oil, No. 2....9-9.875
- Gas oil, 48-52 d.i....9.25-10.125
- Fuel oil, bunker "C"....$2.00-2.10

Caribbean, cargoes
- Avgas, Grade 100/130....16
- Gasoline, 93 oct research prem....11
- Gasoline, 87 oct research reg....10.125
- Gasoline, 79 oct research....9.125
- Gasoline, 70-72 oct motor method....9
- Kerosine....9.75
- Heating oil, No. 2....9
- Gas oil, 48-52, d.i....9.25
- Fuel oil, bunker "C"....$2.00

New York Harbor, barges
- Kerosine....11
- Heating oil, No. 2....10-10.5
- Fuel oil, No. 6....$2.37-2.45

Okla-Group 3, northern shpt., bulk
- Gasoline, 89 oct reg....12-12.5
- **Kerosine....10.25↓-10.75**
- Heating oil, No. 2....9.25-9.5
- **Fuel oil, No. 6....$1.80-1.90↓**

Chicago, bulk
- Gasoline, 91 oct reg....12
- Heating oil, No. 2....10.25-11.35
- Fuel oil, No. 6 high sulfur....7.4-7.5

Los Angeles, rack
- Gasoline, 88 oct reg....11.5-12.65
- Diesel fuel, PS 200....8.5-11.25
- Light fuel, PS 300....$2.80
- Heavy fuel, PS 400....$2.15-2.35

Natural Gasoline, Grade 26-70
- FOB Group 3....4.5
- FOB Breckenridge, Tex....4

LP-Gas
- Propane, Oklahoma (Group 3)....4.5

Pennsylvania Lubes
- Bright stock, 25 p.t....22
- 200 vis. neutral, 25 p.t....21

Mid-Continent Lubes, Tulsa basis
- Bright stock, solvent 95 v.i....23-24
- Neutral, solvent, 200-210 vis....19.5-20.5

Gulf Coast Lubes
- Bright stock, solvent, 95 v.i....24
- Neutral, solvent, 200 vis....20.5

Eastern Hemisphere

Singapore (Pulau Bukom), cargoes
- Avgas, grade 100/130....17.25
- Gasoline, 79 oct research....9.75
- Kerosine....10.75
- Gas oil, 48 d.i. minimum....10.5

KEY PRICES—CRUDE OIL

(2¢ differential per deg., of grav. applies except as noted)

Western Hemisphere

United States (at the well)
- Mid-Continent, 36.0-36.9....$2.77-2.97
- North Dakota, 36.0-36.9....2.62-2.87
- Texas:
  - Gulf Coast, low cold test, 26.0-26.9....3.50
  - Gulf Coast, Upper & Lower, 26.0-26.9....2.92-3.22
  - West Texas, sweet, 36.0-36.9....3.00
  - West Texas, N. M., inter., 36.0-36.9....2.93
  - West Texas, N. M., sour, 32.0-32.9....2.71
  - East Texas, flat....3.25
  - Mirando, 28.0-28.9....3.31
- Illinois Basin, flat....3.00
- Pennsylvania Grade, Bradford dist., flat....4.25
- California, Signal Hill, 21.0-21.9....2.50-2.54†
- North Louisiana-Arkansas, 36.0-36.9....2.77-3.02
- Wyoming, sweet, 36.0-36.9....2.85-2.90
- Wyoming, sour, 32.0-32.9....2.63-2.71

Canada (flat prices, at the well)
- Acheson-Stony Plain (Alta.)....$2.47
- Leduc-Woodbend (Alta.)....2.53
- Redwater (Alta.)....2.42
- Daly (Man.)....2.21
- Smiley (Sask.)....2.18

Venezuela (Cargoes, FOB lifting port designated)
- Cumarebo, 47.0-47.9, Tucupido....$3.34
- San Joaquin, 41.0-41.9, Puerto la Cruz....3.10
- Oficina, 35.0-35.9, Puerto la Cruz....2.78-2.80
- Tia Juana, Medium, 26.0-26.9, Amuay....2.30
- Bachaquero, flat, Las Piedras....1.73-1.88
- Tarra, 38.0-38.9, San Lorenzo....2.83
- Lagunillas Heavy, flat, Cardon....2.10

†*Differential per deg. of grav. varies.*

Eastern Hemisphere

Middle East, Persian Gulf (Cargoes, FOB lifting port)
- Arabia, 34.0-34.9, Ras Tanura....$1.89-1.90
- Safaniya, 27.0-27.9, Ras Tanura....1.50
- Iran, 34.0-34.9, Bandar Mashur....1.86-2.04
- Iran, 34.0-34.9, Abadan....1.81
- Iraq, 35.0-35.9, Fao....1.80
- Kuwait, 31.0-31.9, Mina-al-Ahmadi....1.67
- Qatar, 41.0-41.9, Umm Said....2.05
- Neutral Zone, Burghan, 23.5-24.4, Mina Saud....1.51
- N. Zone, Eocene-Ratawi, 20.5-21.4, Mina Saud....1.38

Middle East, Eastern Mediterranean
- Arabian, 34.0-34.9, Sidon....$2.27
- Iraqi, 36.0-36.9, Tripoli, Banias....2.31

Far East, Cargoes, FOB Lutong, Sarawak
- Seria Light, flat....$2.57

KEY TANKER RATES

(Last paid, per long ton, single voyage)

U.S. Gulf-New York, clean (USMC—37¼%) $1.78↑
- U. S. Gulf-New York, dirty....(USMC—37½%) $1.78
- NWI-USNH, dirty....(USMC—65%) $0.96
- NWI-UK/Cont., dirty....(Scale—30%) 22/9*
- Persian Gulf-UK/Cont., dirty....(Scale—70%) 20/10*
- Persian Gulf-USNH, dirty....(USMC—70%) $3.81

**Sterling.*

DEPT/Transportation & Storage

Tomorrow's Pipeline: A New Breed

- **With operating experience piling up, pipeline planners are getting a much clearer idea of how to avoid many troublesome characteristics in coming pipelines.**
- **This selectivity of design also has application in adapting existing lines to new uses.**

Pipeliners are having some important second thoughts about the design of new lines and the redesign of existing lines.

Fundamental changes in pipeline design occur only rarely. But new less-basic concepts in pipeline design, when enough of them accumulate, can add up to changes just as significant.

Pipeliners this week have a rash of such less-basic design concepts to mull over as the result of the just-concluded annual pipeline conference of API's Division of Transportation.

Design of new pipelines—for crude, products, or gas—should take into account the growing need for centralized control of pumping or compressor stations, and of takeoff points, it's now felt.

There's no longer much doubt that such centralized control is becoming more necessary all the time. The spiraling labor costs of today—and the need for faster, more accurate responses at stations—are now causing a solid shift toward the central control concept (PW—Apr.3'59,p44).

James F. Stephenson and Marlan G. Jordan, of Laurel Pipe Line Co., describe the application of this concept on the new Laurel system this way:

"The dispatch board for the system and the central console for the line's remotely operated booster station are located in the Camp Hill office, near Harrisburg, Pa.

"All intelligence indicated on the dispatch board is logged on an automatic typewriter at a predetermined time interval, or can be logged upon demand.

"Intelligence received from the three refinery delivery points includes positive displacement meter readings and line pressure indicated continuously. And flow rates in barrels per hour are recorded continuously.

"Intelligence received from the 18 take-off metering stations includes positive displacement meter readings and mainline pressure, indicated continuously; and product analyzer or batch detector and flow rate recorded continuously."

And operating experience is now piling up in favor of special design of tankage, manifolds, pump stations, and auxiliary equipment in products lines to minimize product commingling.

William W. Holt, Jr., of Plantation Pipe Line Co., has this to say about minimizing contamination: "Any small reduction in such [contaminated] volume results in a direct saving."

Therefore, Plantation strongly recommends several precautions at the outset of product pipelining.

- "Receipts into tankage should be carefully separated, in order that a sharp interface and minimum contamination can be established when pumping into the pipeline.

"Tanks can be constructed with sump bottoms, which permit almost complete pump-out and consequently permit the tank to be used for storage of liquids having different specifications."

- "Fill and pump-out lines for tankage should be constructed, if possible, with a proper drainage slope and without pockets or loops.
- "The length of nozzles between valves and headers and risers should be kept to a minimum."

The latest thinking on determining crude-line sizes indicates a growing reliance on design by computer.

Dr. Leslie Cookenboo, Jr., of Richfield Oil Corp. (L. A.), feels that pipeline design will soon rely more heavily on computers. His reasoning runs this way:

There are distinct economies of scale in building large crude lines, assuming that enough oil is available to fill them.

The most economic of these lines, he says, use ¼-in.-thick pipe, and the optimum number of stations on such lines is determined by the maximum usable pressure.

With the help of linear programming, Cookenboo contends, the selection of an optimum diameter of pipe and an optimum number of stations can be reduced to "a relatively straightforward two-variable marginal costing problem."

Designing for internal surveys of pipelines already in operation is also taking on new importance.

It has proved to be quite difficult, once a pipeline is put into operation, to determine the line's internal condition and operating characteristics. External testing and inspection are possible, but too expensive, most pipeliners feel.

If inexpensive survey methods can be developed, pipeline operating procedures could probably be improved greatly.

A team from Gulf Research & Development Co. now feels that "conducting internal surveys in pipelines is practicable."

Howard J. EnDean, Robert M. Howard, and James E. Knizer report that, on the basis of their recent studies, "methods and equipment for pressure, temperature, and leak recording will probably be simple and rugged."

The Gulf team also predicts that "no special operating procedures or training will be required in conducting or interpreting these surveys."

"Further study," the researchers conclude, "indicates that instrumentation for surveying such items as electrical potential, internal roughness, and corrosion pitting will require electronic-type circuitry."

Future pipeline design may also depend heavily on some of today's research—which is now beginning to come up with conclusions—on problems in pumping heavy crudes, metering, filtration, welding, and pipe itself.

M. J. Dabney, pipeline research coordinator for Esso Research & Engineering Co., figures that today's research projects are critical to the character of tomorrow's pipelines.

Dabney singles out these current pipeline research areas as significant for the future:

- Pipelining heavy crudes. "With the technical knowhow available today, there are several alternate means by which these viscous crudes can be handled by the pipelines . . . But these methods may not be the most economical for the oil to be competitive at the end location . . .

"Perhaps [one of these] will be

Take lubricants, for example

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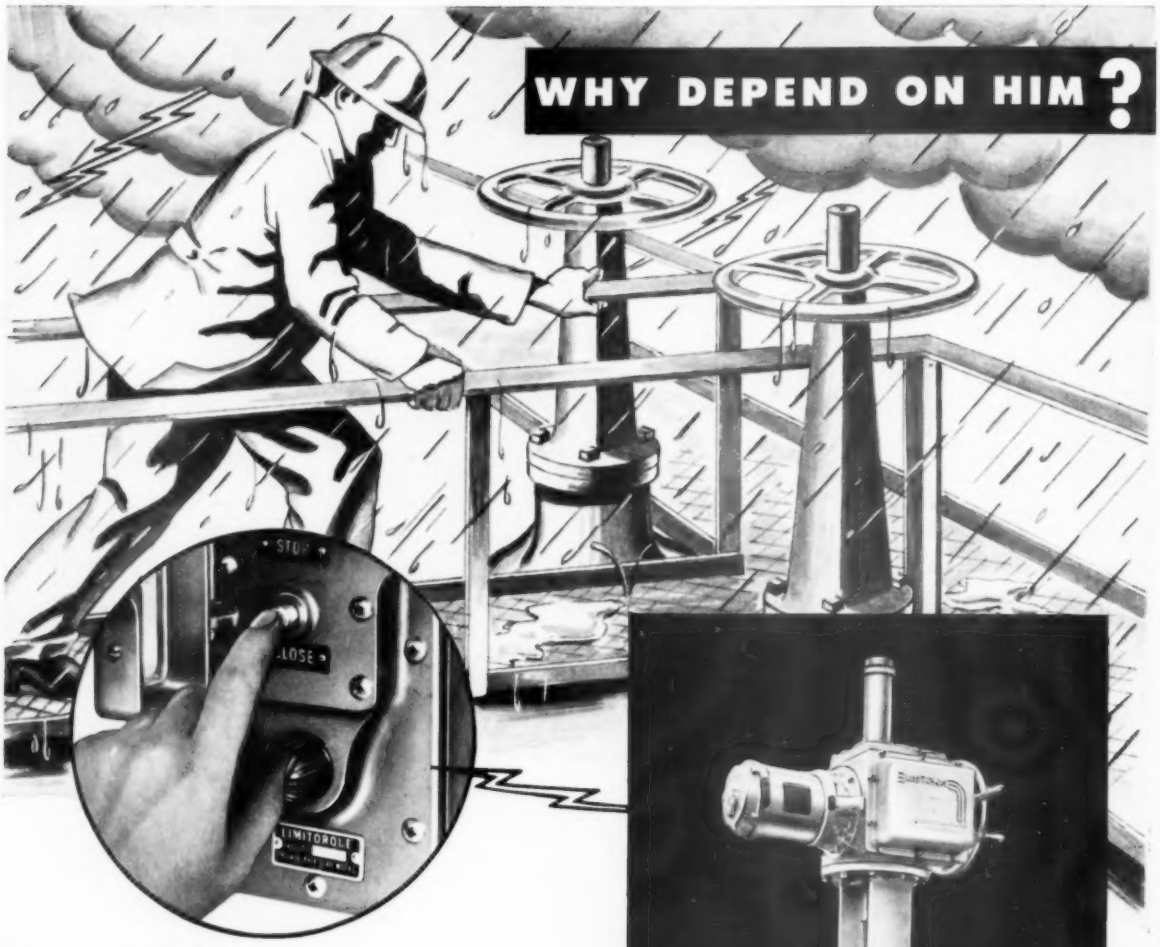

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developed by the time it is urgently needed."

• Metering. "In order to obtain the maximum accuracy from positive displacement meters, with a minimum of time and manpower, 'pushbutton' or automated meter calibration systems are needed.

"A device incorporated in the design of a turbine-type meter to correct for various viscosities now causes this type of meter to have interesting possibilities for accurate measurement of crude oil . . ."

• Filtration. "In the light of the large number of turboprop and pure jet liners in operation, with many more to come, it might be well to re-examine our filtration practices."

• Welding. "With the amount of research effort presently being expended in this direction, it will not be surprising to see an automatic welding process developed within this year."

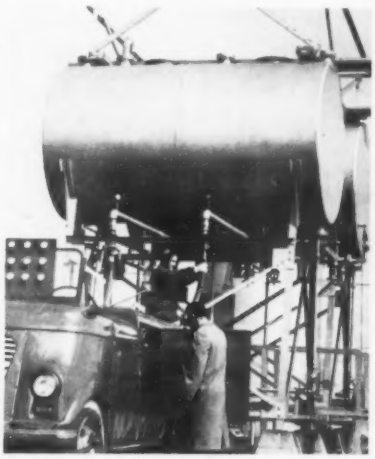
• Pipe. "The glass-reinforced plastic pipe industry has made rapid strides recently. This pipe can now be designed to meet pipeline operating pressures, and the application possibilities are becoming very interesting."

There's news in the redesign of existing pipelines for more up-to-date use, too. Pipeliners who recently converted a crude line to move mixtures of crude and natural gas liquids now look for more such conversions.

Texaco-Cities Service Pipe Line Co. converted its Cushing (Okla.)-to-Chicago crude system to "tight line" operation in late 1957 (PW—Mar.21 '58,p44).

The conversion was mostly a matter of separation of the system's two interconnected parallel lines from Sheldon, Mo., to Wilmington, Ill., and some load rebalancing.

Says A. N. Horne, of Texaco-Cities Service: "This experience does indicate, from a pipeline viewpoint, the feasibility and rather broad possibilities of moving a greater number of petroleum products and natural gas liquids than has been done heretofore through conventional crude or products lines."



"Esso Airport" Handles Jet Fuels

Efficient jet-fuel handling has become a major concern among the oil companies supplying the fuel for the growing fleet of jetliners. Two main reasons: the need to pump a large amount of the fuel aboard a plane in a short time; and the volatility of the fuel itself.

Esso Research & Engineering Co. is studying improved methods of refueling jetliners with this set of "simulated airport conditions" at its Linden (N. J.) research center.

The jet-fuel test facility has a 1,600-ft. pipe section through which the fuel must travel from a storage tank to a mock-up hydrant fueling outlet (above, left); two large tanks about 10 ft. off the ground which serve as the plane's wing fuel tanks; and a "turbofuel servicer" vehicle with equipment for filtering, metering, and pressure control (above, right), which is used to link the "hydrant" and the "aircraft fuel tanks."

Working with this equipment, Esso Research engineers have developed a pumping system that evens out pressures in the over-all fueling system without any loss in the flow rate.

Also, Esso has lowered system peak pressures from 125 psi. to about 65 psi.

Right now, the equipment is being used to evaluate improved designs for surge suppressors and self-actuating valves for the system.

no other pipe insulation cuts costs so many ways

- No breakage in shipment, handling
- Goes on quicker...cuts, fits easily
- Unharmed by fumes and moisture
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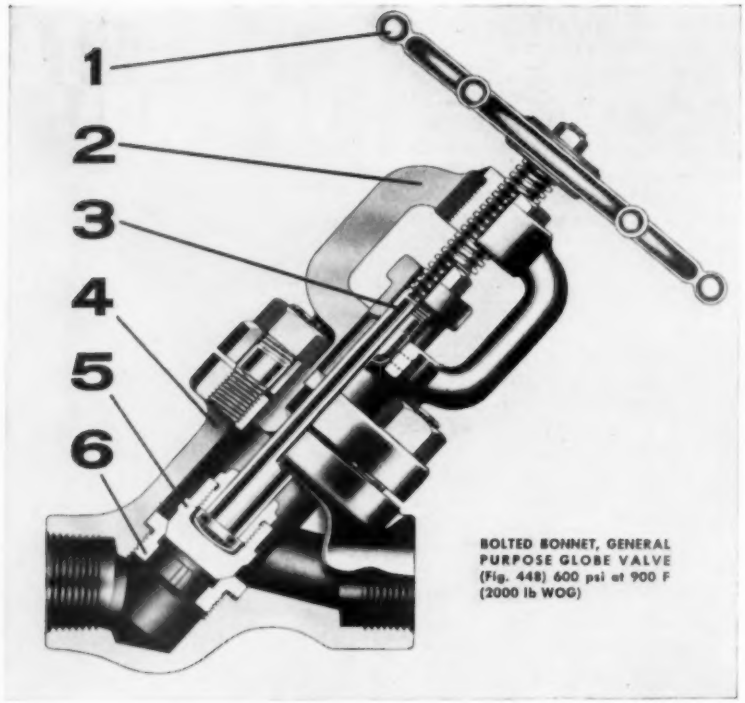

BOLTED BONNET, GENERAL PURPOSE GLOBE VALVE (Fig. 448) 600 psi at 900 F (2000 lb WOG)

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Edward Globe Valves for petroleum services

For hundreds of petroleum services from oil field to refinery, Edward globe valves give longer, trouble-free service at less cost. Here are some reasons why:

1 Handwheel of malleable iron is properly proportioned and knobbed for easy gripping

2 Forged steel yoke withstands rugged service

3 Stem is wear resistant EValloy 13% chromium stainless steel

4 Body of forged steel is streamlined for minimum pressure loss

5 Disk of 13% chromium stainless steel or chromium-cobalt-tungsten alloy steel is also available with Stellite hard surface

6 Replaceable seat is made of wear-resistant EValloy 13% chromium stainless steel or hard-surface Stellite. Integral Stellite seat also available

UNION BONNET, INSIDE SCREW GLOBE VALVE (Fig. 2698) 600 psi at 900 F (2000 lb WOG)

MANY FEATURES AVAILABLE— With Edward globe valves you have a wide selection of features.

- inside screw or O.S. & Y. construction
- screwed ends or socket welding ends
- bolted bonnet (shown above) or union bonnet (below)
- backseat stem or disk-nut shoulder for repacking under line pressure
- ratings to 2500 psi at 1050 F, 10,000 lb WOG
- sizes from ¼" to 2"

Edward builds a complete line of cast and forged steel stop, check, and stop-check valves for all pressures and temperatures.

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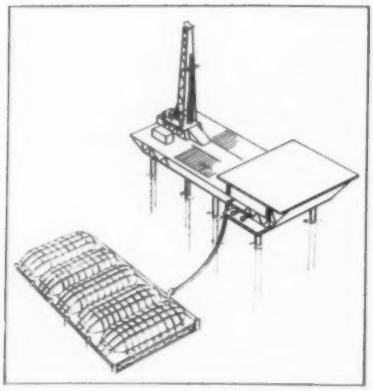


UNDERWATER STORAGE is now planned for offshore production as . . .

Flexible Tanks May Cut Costs Offshore

United States Rubber Co. is now offering a packaged series of large-capacity flexible storage tanks for more economical offshore crude storage.

The proposed system, the company says, is now being considered by several offshore producing companies. It would be the first to use the increasingly-popular fold-up containers (PW—Mar.13'59,p62) in offshore production.

The U.S. Rubber fold-up system might hold as much as 25,000 bbl.

The way the company sees it (diagram), the proposed system might best use a series of twenty 50,000-gal. tube-shaped rubber tanks anchored to the ocean floor. Lines from the rubber tanks would rise to an above-water "plumbing system," which would regulate flow of crude either from surrounding wells into the tanks, or from the tanks into barges.

Hanna Construction Co., of Houston, would handle the construction details.

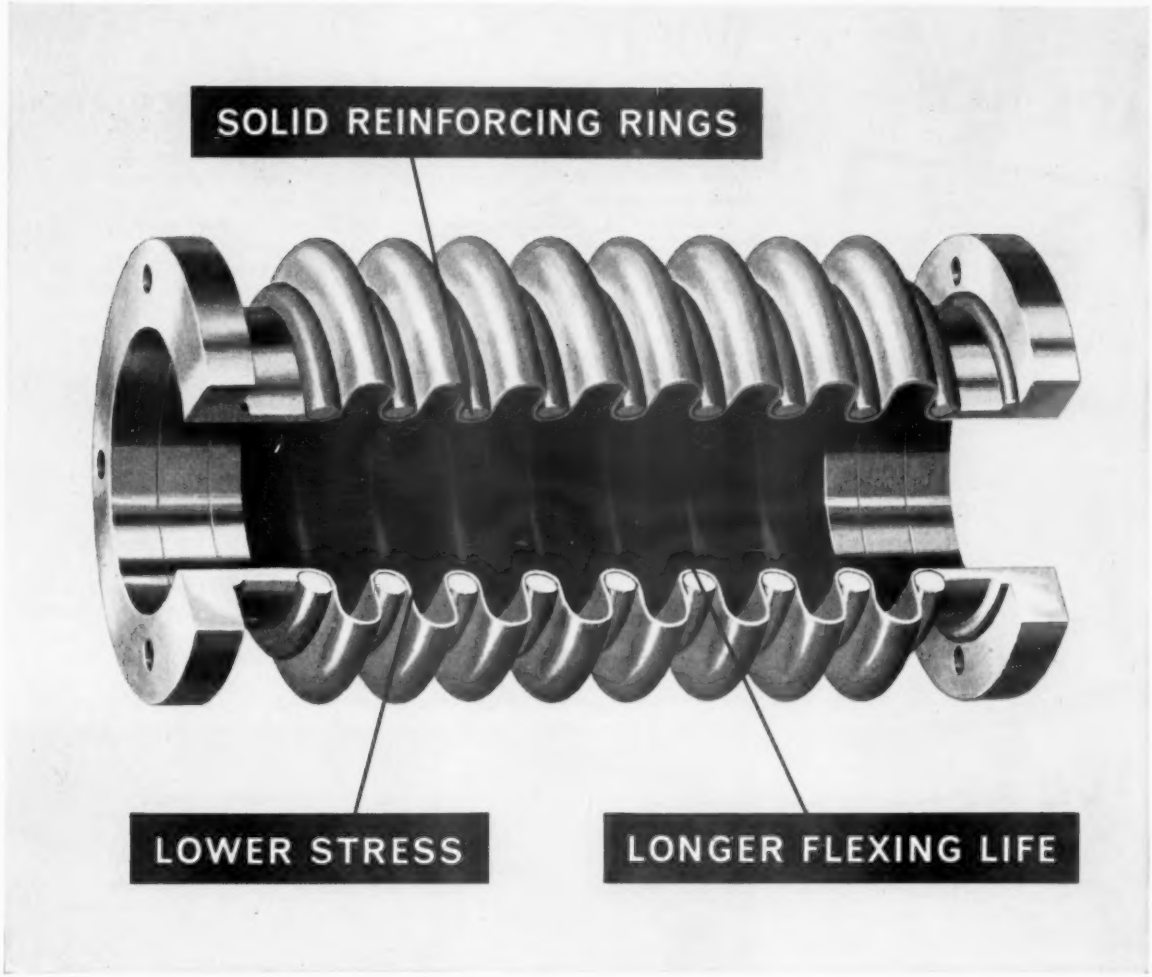
The main advantage of such storage facility, its backers feel, would be a reduced cost of storing crude offshore.

U.S. Rubber and Hanna estimate that, in 40 ft. to 50 ft. of water, storage cost per barrel would be cut from $40 to $25.

In deeper waters, they say, the saving would be even greater.

The safety aspects of such storage are also a major consideration.

In several recent offshore rig fires, a good part of the damage was caused by flaming oil spilling from rig storage areas. This, of course, could not happen with the underwater storage facility.



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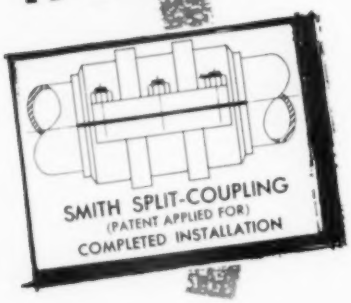

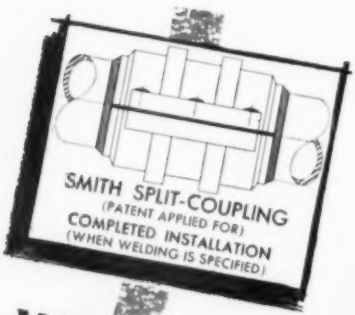

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What's New / IN TRANSPORTATION

The Maritime Administration has authorized further studies on the feasibility of a submarine nuclear tanker.

The administration last week awarded a $38,000 contract for such studies to the Electric Boat Division of General Dynamics Corp. Electric Boat will test various-shaped designs for a 20-knot, 20,000-ton vessel.

However, the Maritime Administration has yet to convince the Budget Bureau or Congress that the atom sub tanker project is worth what it will cost—about $20-million.

•

Great Lakes Pipe Line Co. will begin moving 91-octane regular-grade gasoline on June 1.

The line will accept consignments of this grade of gasoline to all of its Great Lakes terminals except Chicago, which will have a minimum 92-octane requirement.

The system's specifications for 99-octane premium-grade gasoline remain the same.

•

The world's idle tanker fleet has reached 393 vessels, totaling 6.2-million tons, according to the latest survey of Charles R. Weber Co.

The survey reports that 96 tankers totaling 1.8-million tons have gone into layup since Feb. 25.

American-flag tankers out of operation, according to the survey, now total 38, with a combined tonnage of 623,521. However, seven more American-flag tankers were recently designated for layup.

Transco Lays Third Link To New York City

Workmen prepare to bolt down one of the "pipeline nose cones"—flotation tanks on Transcontinental Gas Pipe Line Corp.'s new third system across the Hudson River into New York City. A giant winch across the river on the New Jersey side pulls the dual 24-in. lines into the water, while two giant cranes ease 160-ft. 32-ton segments of concrete-coated pipe into specially designed launching ramps. Two pipe supports, one 60 ft. offshore, the other 120 ft. into the river, carry the pipe to river bottom. There the pipe is laid into a previously dredged trench.

The new Hudson River crossing is part of a $115-million construction program which will enable Transco to increase its daily gas deliveries to 1.6-billion cf/d.

DEPT / International

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What's in Petroleum Week for Ref. Supers?

ENI Revamps Iran Drilling Plans

ROME—Italy's state-owned ENI group has delayed its wildcatting plans for Iran. It will spud its first tests in June—both onshore, and offshore in the Persian Gulf, where it is now building a fixed drilling platform, ENI spokesmen told PETROLEUM WEEK last week.

ENI is reluctant to discuss its plans in detail and did not indicate the site of the projected onshore wildcat.

The offshore test will be located on a Persian Gulf tract that adjoins one held by Indiana Standard. ENI's block is one of three tracts it holds under a partnership venture with National Iranian Oil Co. One is inland, north of the Consortium area, and the third along the Gulf of Oman coast.

Originally, ENI was expected to spud its first Iranian wildcat this spring in the offshore tract, using a portable LeTourneau drilling platform bought for the purpose last year in the U. S. (PW—Dec.5'58,p61).

The revised plan follows diversion of the $1-million platform to Sicily —after it had started across the Atlantic late last year on what was to be a $100,000 tow to the Persian Gulf (PW—Mar.27'59,p46).

The change is due to "coordination" of offshore drilling plans for ENI's holdings in Europe, the Middle East, and Africa, a spokesman said.

Besides the acreage in Iran and Sicily, ENI has new offshore exploration interests in Morocco and in Egypt.

The portable LeTourneau platform, named "Scarabeo," is now being used —in conjunction with the tender "Saipem"—by ENI's Agip Mineraria to drill its first offshore wildcat in Sicily. This test is now below 1,000 ft., offshore from Gela (picture), where Agip has found a field that produces very heavy, asphaltic crude. Further drilling in its Sicilian offshore acreage, ENI said, will depend on results of this test—which is also the first offshore wildcat in Sicily.

There are no present plans to move the portable drilling platform to the Persian Gulf.

A fixed platform is now considered more suitable for the nature of the sea bottom in its Persian Gulf offshore tract, the ENI spokesman said.

It is possible, ENI says, that the Scarabeo might later be transferred to Egypt's Gulf of Suez for offshore drilling on new acreage granted to Cie. Orientale des Petroles (Cope), a company owned 49% by Egypt. The other 51% is controlled by ENI and Petrofina.

THE "SCARABEO," a LeTourneau platform originally bought for ENI's Iranian venture, was diverted to Sicily to drill on offshore test there instead.

The ENI spokesman denied, however, that Cope has signed an $8.4-million equipment contract with Italian firms, with or without an offshore drilling platform included (PW—Apr.24'59,p72).

Egypt's recent announcement to this effect may have alluded to an impending Italo-Egyptian trade agreement, he said. This has just been signed, but details of what it includes have not yet been announced. No Italian manufacturer builds offshore drilling platforms.

ENI is slated to invest $10-million on its foreign operations in 1959-60 out of $122-million allotted to it by the government for capital investment.

This includes $5.6-million for exploration in Iran and $4.4-million for the Morocco refinery that ENI is committed to build under terms of its oil concession there—also a partnership venture with the government.

The fact that $112-million—the major part of its investment allocation for the year—is to be spent in Italy itself underscores the fact that ENI's real problem lies at home. Its operations have again come under fire, this time by Italy's new free-enterprise-minded government.

Aramco Boosts Oil Reserves 5%

Saudi Arabia's proved recoverable reserves were boosted a net 1.8-billion bbl. last year to an estimated 36.7-billion, Arabian American Oil Co. said this week in its annual operating report.

The year's production totaled 1,015,029 b/d, up 2.3% from 1957. About two-thirds of this—678,100 b/d—came from the vast Ghawar field, and 243,373 b/d from Abqaiq. The offshore Safaniya field averaged 38,048 b/d, Dammam 37,238 b/d, and Qatif 18, 270 b/d.

The hike in net reserves was due largely to further drilling in new oil areas discovered in 1957, Aramco said.

Six of 23 deep wells completed in 1958 were drilled in these new areas:

- Three at Khurais, the new inland field near the borders of Aramco's preferential area:
- One in the Fazran area, the new and still undefined northern extension of Ghawar, where further wells are to be drilled this year.
- Two at Manifa, the new off-

What's in Petroleum Week for Ref. Supers?

Refinery superintendent for independent refiner photographed near Houston by W. D. Murdy.

A REF. SUPER, short for refinery superintendent, finds plenty in Petroleum Week. For Petroleum Week broadens the horizon of more than 45,000 men in the oil industry, at all levels and in all segments. It's the magazine where busy oil men keep informed, where they get up-to-the-minute reports on news, technical developments, and trends that affect their daily activities. Out of this information they acquire the industry perspective so vital to doing a good job.

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shore field southeast of Safaniya. The first Manifa wildcat, Aramco said, was the first well in its concession area to find oil in the Lower Ratawi zone of the Yamama detrital limestone, where it was completed. The second Manifa well, about 10 km. south, was completed in the Upper Ratawi.

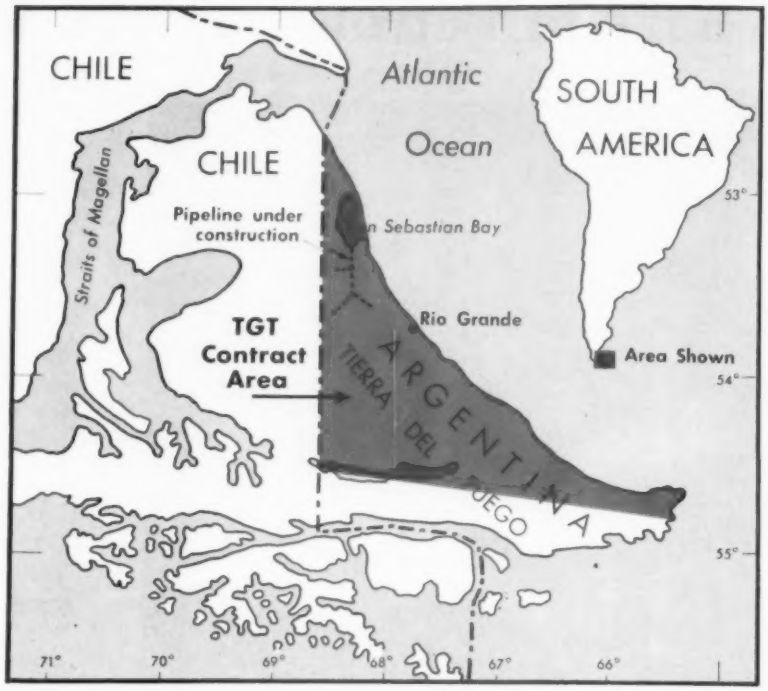
Of the other 17 wells completed, seven are in the Ain Dar area of Ghawar; five at Safaniya; three at Abqaiq; and two at Khursaniyah. At the end of the year, Aramco said, it had 192 producing oil wells—three more than in 1957. In addition, it had three producing gas wells, plus 70 wells shut in.

Exploratory work, as in 1957, was concentrated in the Empty Quarter, with nine field parties active for all or part of the year. Included were one gravity meter-magnetometer party, and four seismograph and four structure drill parties.

The Aramco report also gives several other highlights of 1958 operations:

- Gas and water injection facilities were expanded at Abqaiq and Ghawar, bringing total capital investment in this program to $52.5-million.
- Pipeline capacity was increased by addition of further pumping units that permit boosting delivery of crude to the Trans-Arabian Pipe Line to 450,000 b/d, from 325,000 b/d.
- Construction was started at Ras Tanura of a pier extension that will provide berthing for two more tankers and will increase loading capacity to 1,050,000 b/d from 740,000 b/d.
- The Ras Tanura refinery processed 16.6% of the year's crude output. Throughput averaged 168,119 b/b, down 24,504 b/d from 1957. This reflects a "general decline" in refining activity in the world's major oil producing areas, Aramco said. "Moreover," the company added, "refineries in both consuming and producing areas throughout the world operated at 15-20% below capacity in 1958."
- An alkylation plant will be completed this summer to permit manufacture of 2,000 b/d of aviation gasoline, meeting all Saudi Arabian needs and leaving some for export.
- Out of Aramco's 17,171 employees in Saudi Arabia, 70.2% were Saudis at the end of the year. Of these, 73% held skilled or semi-skilled jobs, compared with only 37% five years ago.

Aramco is owned 30% each by Standard Oil Co. of California, Texaco Inc., and Standard Oil Co. (N. J.), and 10% by Socony Mobil Oil Co.



TGT Starts Argentine Work Soon

BUENOS AIRES — By mid-July, Tennessee Gas Transmission Co. will be starting operations in its new Tierra del Fuego contract area (map) with seismic work in the area north of San Sebastian Bay, known as the Cullen region.

At the same time, TGT will also put two surface geological parties into the interior of its contract area.

These terms are spelled out in the text of the contract, which has just been released in full. The agreement with Argentina's Yacimientos Petroliferos Fiscales was signed last month (PW—Apr.24'59,p70).

The 25-year pact covers exploration and development in an initial 3,456,000 acres. This covers almost all of the Argentine Territory of Tierra del Fuego, except for a barren strip south of Lake Fagnano.

TGT is to start drilling in the Cullen zone in October—that is, within three months of starting seismic work there.

The contract requires TGT to bring in one drilling rig for the purpose as soon as possible. By July, 1960, the company must have a minimum of four rigs in operation.

Laughlin Porter Drilling Co. will do the drilling under a new contract it will sign with TGT.

Laughlin Porter and Ecofisa S. A., an Argentine construction firm, were cosigners of the TGT-YPF pact, under which TGT is absorbing contracts YPF had awarded the two firms in 1957 and assuming YPF's obligations. TGT will sign its own contracts with both—presumably on pretty much the same terms.

The original Laughlin Porter contract, won in competitive bidding against five U. S. companies, called for drilling of 40 wells for $25 per meter drilled. Up to this point, two have been completed.

TGT is assuming responsibility for completion of a 12-mi. pipeline now under construction to San Sebastian Bay by Ecofisa, and for storage and terminal facilities, including submarine tanker-loading lines, that are to be built by Ecofisa. TGT will be reimbursed for the costs by YPF in eight quarterly installments following completion of each project. TGT will operate the pipeline for YPF, and YPF itself will operate the terminal facilities at the bay.

As in other Argentine contracts that include exploration, the company will bear all risks, against payment for oil produced and delivered to YPF.

TGT's payment, in dollars or pesos, will be $11.15 per cubic meter (about $1.77 per bbl.) after it has delivered an initial 504,000 bbl. to YPF free, in return for use of existing facilities

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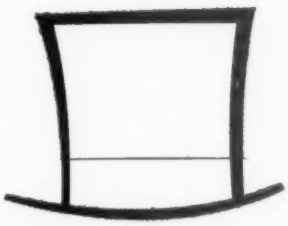

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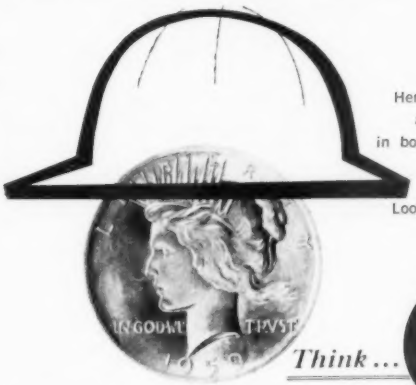

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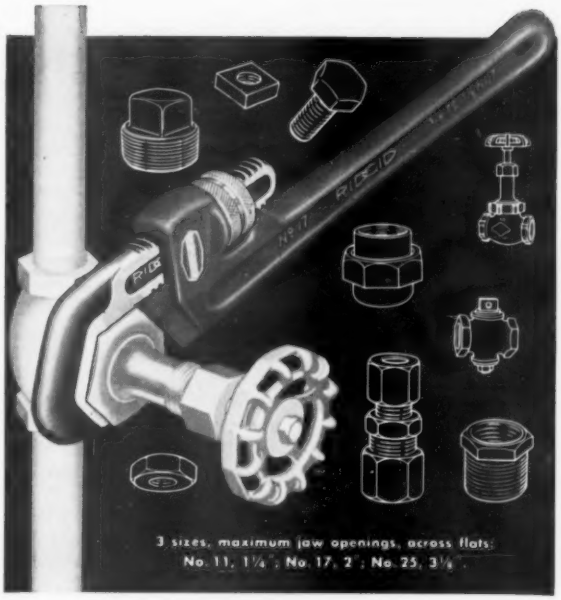

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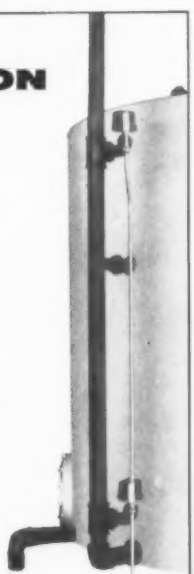

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The company is committed to a minimum investment of $10-million for the first three years.

It may then withdraw entirely, or else select 11,520 acres for development, while investing another $3-million in exploration on the rest of the acreage in the second three years.

If TGT has invested less than $20-million by the end of the sixth year, the acreage will be reduced to the development areas, which then may be doubled to 23,000 acres.

If its investment has been $20-million or over, TGT's original 3,456,000 acres will be reduced 20% at the end of the sixth year, and another 20% at the end of the tenth.

Argentina estimates that its Tierra del Fuego reserves exceed 55-million bbl. of high-quality crude, which ranges from 40- to 42-gravity.

Of 26 wells drilled by YPF since oil was first found there in 1949, 12 are producers—most of them gas wells.

The exploratory risk is considered relatively great by Argentine experts because the oil-bearing structures are small and spottily located, though close to the coast.

Iran Discovery May Spur Bidding

National Iranian Oil Co.'s new No. 2 Saradjeh gas distillate discovery in central Iran may spur bidding for rights in the two new districts recently opened (PW—May8'59,p8).

The well is reported to have an open-flow potential of more than 40-million cu. ft. of gas daily, together with some high-gravity oil. It's the second wildcat drilled by NIOC's Iran Oil Co. on the flank of a large anticline 30 mi. south-southeast of Alborz, in the Qum area.

The No. 2 was carried to a total depth of 8,586 ft. in Oligo-Miocene limestone.

Earlier, the well had tested 80 b/d of 46-gravity, sulfur-free oil from around 8,000 ft. (PW—Feb.27'59, p40).

The well is located near the northwestern corner of District 14, the second of two 23,000-sq. mi. areas just opened to bids for new oil rights in the Greater Qum Basin. Both are separated from the Persian Gulf by mountains.

An outlet would be provided by a pipeline to a Turkish-port that Iran proposes to build if and when sufficient production is established.

What's New / AROUND THE WORLD

AUSTRALIA—The government is taking further steps to encourage foreign capital participation in oil exploration:

- Its present annual subsidies for drilling will be increased by $2.3-million.
- Special tax concessions now granted to Australian investors in oil exploration companies will be extended to non-Australians and to Australian subsidiaries of foreign companies.
- An extensive program of additional topographical and geological work will be undertaken by the Bureau of Mineral Resources, and the information will be made freely available to bona fide investors.

•

FRANCE—Esso has had a promising oil show in a new wildcat 12½ mi. north of its Parentis field, in southwest France.

The company announced last week that the Cazaux wildcat tested 15 bbl. of crude, with a small quantity of gas, in less than an hour from the top of the Albian (Middle Cretaceous), at 7,730 ft. The oil is similar to that of Parentis, where oil is found at depths ranging from 6,890 ft. to 7,875 ft. in the Neocomian (Lower Cretaceous).

•

TURKEY—Tidewater Oil Co. is abandoning its second wildcat below 11,650 ft. in southeastern Turkey, where it holds 3.6-million acres jointly with Atlantic Refining and Texaco-Seaboard (PW—Mar.27'59,p44).

The test, No. 1 Ebyat, was drilled near the Syrian border about 50 mi. west of Nuysaybin. The group's first wildcat, drilled last year 30 mi. west of Ebyat, discovered a natural gas zone but no oil, Atlantic said last week. It was abandoned at 12,506 ft. A third wildcat is scheduled for this summer.

•

ABU DHABI—Drilling is being continued below 9,125 ft. in No. 2 Murban, the wildcat that promises a fresh clue to Trucial Coast oil prospects.

The wildcat has already had a "show" of oil and gas, Iraq Petroleum Co. confirmed in London last week (PW—Feb.13'59,p41). The site is at Tarif, 5 mi. south of No. 1 Murban, the only one of IPC's Trucial Coast tests that ever found any oil. The No. 1 well has remained a mystery since 1953, when it produced at the rate of 1,500 b/d, ran into mechanical difficulties, and then failed to test oil when reopened.

•

NICARAGUA—Two 10,000-ft. wildcats are slated within the next six months by Occidental Petroleum Corp., a Los Angeles producer that just acquired four concessions on Nicaragua's west coast.

Armand Hammer, president, said last week that the first will be spudded within 90 days. The company has budgeted $500,000 for the two, he said.

The concessions, totaling 809,981 acres, were acquired from Empire Trust Co.'s Nicaragua Oil & Mineral Development Co. The acreage is traversed by the Pan American Highway.

•

LIBYA—Oasis Oil Co. last week completed its third discovery well on Block 32 (PW—Apr.24'59,p69).

The well, a stepout 8 mi. southeast of its Dahra discovery, found a new oil zone near the southern boundary of the 1¼-million-acre tract, which Oasis operates for Ohio Oil (its parent), Amerada, and Continental.

Ohio said the F-1-32, flowed at the rate of 30 bbl. per hour of 41-gravity crude on test through perforations at 3,160-230 ft., in a zone produced gas in the Dahra discovery well.

•

QATAR—Shell is definitely planning to resume wildcatting on its Qatar offshore concession.

The question had been left unsettled ever since Shell's drilling platform was wrecked 2½ years ago while moving to a third site after a second dry hole (PW—Feb.1'57,p16). Last week Shell said in London that its new Dutch-built mobile drilling platform, now undergoing trials, will be towed to the Persian Gulf site this fall.

•

ISRAEL—Final details are now being worked out on a $20-million plan

for a 16-in. crude pipeline link from the Gulf of Aqaba to the Haifa refinery, which is being operated at only about 30,000 b/d of its 80,000 b/d capacity, for domestic needs only.

Israel's state radio said last week that the money will be put up by a "foreign group" headed by Edmond de Rothschild, of the French banking interests, with a group of Israeli banks also participating. The plan, already approved by the Finance Ministry, will come up for Parliamentary approval shortly.

The plan involves replacing the present 8-in. pipeline that runs 150 mi. from the Aqaba port of Elath to Beersheba with a new 16-in. line, to connect there with the existing 16-in. line to Haifa. Capacity of the 16-in. line will be 70,000 b/d.

•

ARGENTINA—The "battle of petroleum" being waged through joint action of the government's YPF and foreign oil companies will lead to drilling of 9,900 wells in 1959-64, President Arturo Frondizi told Congress in a message marking the start of the second year of the constitutional government.

During the past 51 years, by contrast, he said, "only 6,877 wells were drilled, although Argentina ranks seventh among the world's oil-possessing nations." (The latest YPF estimate of proved reserves is 3.15-billion bbl.)

"Oil is already being extracted in various zones of the country," said Frondizi. "YPF alone increased its output 33% in the first quarter of 1959 as compared with the same period last year."

•

USSR—Twenty offshore wildcats scheduled for 16,000 ft. are currently being drilled in the Caspian Sea south of Apsheron peninsula, according to Tass, the government news agency.

A total of 3.6-million ft. of exploratory drilling is planned in this area under the 1959-65 Seven Year Plan. Average well depth will be 10,000 ft., and the deepest nearly 20,000 ft. Tass said 40% of the wells will be drilled from offshore platforms in water more than 65 ft. deep.

•

LEBANON—Deliveries of Saudi Arabian crude to Sidon were cut to 294,025 b/d in April—nearly 20% below the April, 1958, deliveries of 367,030 b/d by Trans-Arabian Pipe Line Co.

PAKISTAN—The possibility of exporting "frozen" methane from the huge Sui gas field to Japan, Australia, and South Africa is being studied by Constock International Methane, Ltd., which recently completed its first trial shipment of liquefied gas from the U.S. to Britain.

A top-level Constock delegation, including president E. F. Battson, vice-president J. A. Murphy, and advisor Adm. A. W. Radford, visited Sui and Karachi late last month at the invitation of the Pakistan government for preliminary technical surveys and exploratory talks, the British-owned Pakistan Petroleum, Ltd., disclosed last week.

Constock officials expressed "cautious optimism" about the prospects of exporting gas from the field to international markets, PP said, and will now study all aspects of the project.

•

MEXICO—Pemex last week signed its formal $10-million agreement for purchases of British-made oil equipment on long-term credit with British Oil Equipment Credits, Ltd. (PW—May1'59,p50). The terms: a 5% deposit on placement of orders, 10% on delivery, and the balance in ten six-month intervals at 5½% interest.

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APACHE CORPO

Minneapolis/Tulsa/Denver

DEPT/Personals

G. T. Pearson

R. C. Brown

R. C. BROWN will become vice-president and a director of Continental Oil Co., on June 1, with headquarters in London, and **G. T. PEARSON** will succeed him as president and a director of Hudson's Bay Oil & Gas Co., Ltd., Calgary, a Conoco subsidiary. Brown, who will be Conoco's foreign representative, was named vice-president, general manager, and a director of Hudson's Bay Oil in 1948. In 1953 he was elected president. Pearson has been general manager of Conoco's southwestern region, at its offices in Ft. Worth, since 1956.

CLIFFORD R. SWETT and **WILBUR J. NOLL** have been elected vice-presidents of National Wax Co., Skokie, Ill. Swett is in charge of National's product development and research, and Noll is in charge of production and traffic. **John R. Lauterbach,** formerly associated with Socony Mobil Oil Co., has joined National as domestic sales manager. Lauterbach has been in charge of process products sales, including wax, in Socony's Milwaukee and Chicago divisions.

WINFIELD GIVENS has been elected executive vice-president, and **H. J. Weeks** vice-president, of Sun Oil Co.'s eight foreign production subsidiaries. Givens was formerly vice-president of the subsidiaries, as well as foreign representative for Sun's foreign operations department. In his new position, his responsibilities will be in governmental contacts and public relations. He continues as manager of Sun's land department. In addition to his new responsibilities as vice-president, Weeks continues as geological counselor for the parent company's foreign operations department. At the same time, Sun has established two new foreign subsidiaries, Argentine Sun Oil Co. and Bolivian Sun Oil Co. The six other companies are Bahamian, Colombian, Cuban, Guatemalan, Pakistan, and Venezuelan Sun Oil Companies. **P. W. McFarland** has been elected vice-president and general manager of the two new subsidiaries, the same position he holds with the other foreign subsidiaries, except Pakistan Sun. **John D. LaTouche** has been reelected vice-president and general manager of the Pakistan subsidiary.

WILLIAM W. EVERSMANN has been named vice-president in charge of Hartol Petroleum Corp.'s sales operations. He has been Hartol's sales manager since 1958.

J. W. HANCOCK has become general superintendent of exploration in the Amarillo area for Natural Gas Pipeline Co. of America, Texas Illinois Natural Gas Pipeline Co., and Texoma Production Co., all affiliates. Hancock will head the newly created exploration division, and will also supervise operating activities of Texoma and another affiliate, Peoples Production Co. **S. E. Spurgeon** succeeds Hancock as superintendent of drilling for the three companies in the same area. Spurgeon was formerly a district drilling superintendent. **L. L. Farmer** has been named to the newly created position of superintendent of gas contracts, and **W. B. Verner,** to the newly created position of gas supply engineer, for the affiliates in Amarillo. Farmer was formerly gas purchase contracts engineer, and Verner was superintendent of NGPL's Stinnett (Tex.) compressor station. Promotions of Natural Gas Pipeline and Texas Illinois compressor station personnel include: **D. R. Wendele,** formerly assistant superintendent at Fritch, Tex., to assistant superintendent at Stinnett, succeeding Verner; **R. L. Pivonka,** Wharton (Tex.) station superintendent, to assistant superintendent at Fritch, succeeding Wendele; and **R. G. Shaddox,** special engineer in the Chicago office, to the Wharton station, succeeding Pivonka.

J. W. Hancock

L. J. Brunel

LOUIS J. BRUNEL has been named president of Bishop Oil Co., San Francisco, succeeding **W. M. Wallace Mein, Jr.,** who continues as chairman. Brunel was formerly Bishop's vice-president and general manager.

ROBERT H. MARTIN is the new manager of The Texas Co.'s Trinidad operations, with offices in New York City. Martin, with Texaco since 1939, was most recently secretary of the company's executive producing committee, in New York.

W. E. HOWELL has been named president of Fain-Porter Drilling Corp., Oklahoma City. He succeeds **Frank M. Porter,** president of the American Petroleum Institute, who will serve as chairman of Fain-Porter. Howell was formerly vice-president.

DILLON GLENDINNING has been appointed treasurer of Mobil International Oil Co., international operating division of Socony Mobil Oil Co. He was associated with the U.S. Treasury and State Depts. before joining Socony Mobil's economics department in 1957. **Hamilton P. Caldwell** has been named to the newly created position of manager of manufacturing of Mobil Oil de Venezuela. He will be headquartered in Caracas. **Joe E. Penick** succeeds Caldwell as manager of the Augusta (Kan.) refinery of Mobil Oil Co., domestic operating division of Socony. **David Christison,** formerly assistant to the manager of Mobil's Buffalo (N. Y.) refinery, succeeds Penick as manager of the East Providence (R.I.) refinery.

LLOYD L. OWENS, formerly district sales manager in Memphis, Tenn., for the Lion Oil Division of Monsanto Chemical Co., is now sales training manager of the station sales section, in El Dorado, Ark. **Edmond N. Carter** is now assistant manager of the El Dorado district. He was formerly sales supervisor at Ft. Smith, Ark.

CHARLES H. RUOFF, JR., has joined the sales department of Texas City Refining, Inc., Texas City, Tex. He was formerly division manager of the Pennsylvania Farm Bureau's petroleum division, in New Cumberland, Pa.

ROBERT N. CURRY is the new assistant superintendent of gas measurement for Texas Gas Transmission Corp., in Owensboro, Ky. During his ten years with Texas Gas, Curry has worked as a dispatcher in the pipeline department and in various positions in the measurement department. He was most recently supervisor of the measurement office.

R. N. Curry

A. L. Jones

DR. A. LETCHER JONES has been promoted to supervisor of basic research in the chemical and physical research department of Standard Oil Co. (Ohio), Cleveland. Jones, with Sohio since 1946, has done research in the areas of liquid thermal diffusion, organic analytical reagents, magnetic susceptibility, separations of hydrocarbons, properties of petroleum fuels, and physical techniques in petroleum.

JOHN G. WALLING, controller of Honolulu Oil Corp., San Francisco, takes over the additional post of treasurer, succeeding **W. P. Roth.** Roth, who has served as treasurer since 1930 and as vice-president since 1931, has resigned from both positions. He continues as a Honolulu director. Walling has been with the

company since 1933, and has served as assistant treasurer since 1947, and as controller and assistant treasurer since 1958. **F. Dow Grant** has been elected assistant treasurer. Grant was appointed assistant to the controller earlier this year.

THOMAS A. REITER has been named a section head in the petroleum development division of Esso Research & Engineering Co., Linden, N. J. Reiter's initial work with Esso Research involved process design for fractionators and fluid catalytic cracking units. More recently, his work has concerned engineering and cost studies of the application of nuclear radiation to petroleum processing. In his new position, he will be concerned with isomerization, radiation, and lubes and waxes.

C. J. Guzzo

J. L. Lenker

C. J. GUZZO becomes senior vice-president, and **J. L. LENKER,** vice-president, of Gulf Oil Corp., Pittsburgh. Guzzo has been Gulf's vice-president in charge of domestic marketing since 1954. In his new position, he will be a member of the company's executive group, consisting of the president, the executive vice-president, and the senior vice-presidents. Lenker is currently vice-president in charge of marketing and a director of British American Oil Co., Ltd., Toronto, Gulf affiliate. Lenker, prior to joining British American in 1956, had been with Gulf for 22 years. In his new capacity, he will be responsible for the general direction of marketing Gulf products in the United States.

PHIL H. DESCHNER has been promoted to assistant director of manufacturing accounting for Continental Oil Co., with headquarters in Ponca City, Okla. He was formerly assistant to Conoco's controller, in Houston. He succeeds **H. F. Shea,** who was recently appointed director of the manufacturing accounting division.

FLOYD H. MILLER has joined Petroleum Research Corp., in Denver, as manager of geological operations. He was formerly district geologist for British-American Oil Producing Co., in Denver.

SAMUEL E. CHARLTON is the new manager of Esso Standard Oil Co.'s Pennsylvania sales division, and **DuVal F. Dickey** is assistant manager. Charlton has been acting manager of that division since **J. F. Dixon,** manager, accepted an assignment in Sweden with another Standard Oil Co. (N.J.) affiliate, last September. Before that, Charlton was assistant manager of the division. Dickey was most recently manager of service station development for Esso in New York. **Guy V. Mallonee,** formerly dealer merchandising manager in Esso's New York sales division, succeeds Dickey.

P. C. Heinsohn

F. A. Sheriff, Jr.

P. C. HEINSOHN is manager of Sinclair Refining Co.'s eight-state southeastern marketing division, and **F. A. SHERIFF, JR.,** succeeds him as assistant manager. Headquarters for the southeastern division are in Atlanta, a. Heinsohn succeeds **E. J. Bassett,** who moves to Kansas City, Mo., as vice-president and general sales manager for Sinclair's western region. Heinsohn has been assistant manager in Atlanta since 1957. Sheriff was most recently district manager in Tennessee.

L. MILLARD GELVIN has been elected assistant treasurer of Sunray Mid-Continent Oil Co., Tulsa. He served in several executive capacities with Gulf Oil Corp. in its Tulsa office from 1952 to 1956. Most recently, he was associated with the producing firm of B. F. Whitehill Co., Tulsa, as manager of operations and production. **Ammon M. Wright** has been named assistant division manager of exploration for Sunray's central division, with headquarters in Oklahoma City. Wright was formerly district landman in western Oklahoma.

L. M. Gelvin

H. D. Monroe

H. D. MONROE has been promoted to assistant manager of the Louisiana division in Esso Standard Oil Co.'s marketing department, with offices in New Orleans. He succeeds **W. H. Johnson,** who becomes assistant to the manager of marketing development of Standard Oil Co. (N. J.), New York, Esso's parent. Monroe was most recently sales manager in the Louisiana division marketing office, in New Orleans. At the same time, **J. B. St. Pierre** was named to the newly created position of dealer sales manager in the Louisiana division, at New Orleans. He was formerly district manager in Baton Rouge.

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MID-CONTINENT SUPPLY CO. has named a new export manager, a new South American agent, and six new division managers. **L. T. Ratliff** is the new export manager in New York, and **L. B. Levell** is the agent for Argentina, Bolivia, Peru, Brazil, Chile, Paraguay, and Uruguay, with offices in Buenos Aires. Ratliff was most recently manager of Mid-Continent's Tulsa division and, before that, was manager of the Los Angeles export office. Levell was formerly Mid-Continent's assistant sales manager in Ft. Worth. Mid-Continent's six new division managers are: **J. L. Voss**, formerly Houston division sales representative, now division manager there; **J. O. Ramsey**, formerly assistant division manager in New Orleans, now division manager there; **W. W. Arnold**, formerly Denver division manager, now manager in Midland; **R. S. Weilman**, formerly division manager in Houston, now division manager in Wichita Falls; **C. H. Hickman**, formerly division manager in Wichita Falls, now manager in Tulsa; and **R. L. McAnally**, formerly Denver division sales manager, now division manager there.

N. W. MANN has been named vice-president in charge of U.S. and Canadian operations, and **G. J. Kohler Jr.**, vice-president in charge of Latin American operations, for Geophysical Service, Inc., Dallas. Mann was formerly manager of Western U. S. operations, and Kohler was manager of GSI operations in Latin America. **Ray H. Wright**, formerly manager of Canadian operations, moves to Dallas to take over Mann's former position. **Dan F. Brennan**, formerly a supervisor for GSI in Calgary, succeeds Wright as manager of GSI's Canadian operations.

HOMER E. BROWN is the new office manager of the Houston international division of Cameron Iron Works, Inc. Brown, with Cameron since 1935, has served as sales liaison director in New Orleans for the past two years. He has also represented Cameron in London, New York, and West Texas in the sales and service of the company's drilling and production control products.

BILL J. RAMEY has rejoined Western Geophysical Co. of America as New York representative, at the company's new branch office in New York City. He was most recently general manager for an oil field service company. Ramey was party manager on various land and offshore seismic surveys for Western Geophysical from 1951 to 1956.

J. F. (Bud) WRIGHT and **JOHN J. PENN** have formed Testers, Inc., in Houma, La. The new service company will have skid-mounted, two-phase separator units, line heaters, tanks, and flow lines, designed to test oil and gas wells in the Gulf Coast area.

DR. NORRIS JOHNSTON is in Buenos Aires, Argentina, organizing Petroleum Technologists to engage in laboratory services. Johnston is president of Petroleum Technologists, Inc., Dallas, subsidiary of Tekoil Corp.

FRANCISCO (Frank) CHAIREZ, former chief chemist with Eastern States Petroleum & Chemical Corp., Houston, has joined National Aluminate Corp. as manager of Mexican operations, in Mexico City.

M. T. BANKS has joined the sales staff of Instruments, Inc., Tulsa. He will be responsible for regional sales in Oklahoma and Kansas. He was formerly in the electronics section of Douglas Aircraft Co.

D. M. JACKS has been named vice-president and general manager of Visco Products Co., Houston. He was formerly vice-president in charge of sales. He succeeds **Charles F. Spangler**, who was named management consultant. Spangler, who retires in 1960, will assist a new management team, which includes Jacks and **Dr. W. H. Kirkpatrick**, vice-president of research and manufacturing. At the same time, **Paul E. Southern** was promoted to manager of administrative services.

HENRY C. TOOLEY has been appointed plant manager of the Missouri City plant of W-K-M, a division of ACF Industries, Inc. In this newly created position, Tooley will be responsible for all manufacturing functions at the plant, and will report to **R. O. Wynn**, vice-president of manufacturing. Tooley was formerly executive vice-president of Reed Roller Bit Co., and was most recently on special assignment with Cameron Iron Works, Inc.

H. C. Tooley

N. D. Baker

NEWTON D. BAKER moves up to the newly created position of marketing vice-president of Black, Sivalls & Bryson, Inc. He was most recently director of employee and public relations for the company. In his new position, he will participate in the review and analysis of marketing operations in all divisions, and assist division sales managers with sales training and sales planning programs. He will also continue to be responsible for all advertising, sales promotion, and public relations, and will serve in a staff capacity in employee relations.

C. B. Carter

A. R. Meyer

A. ROBERT MEYER, vice-president of National Supply Co., Pittsburgh, now functions in a staff capacity in the company's export division in New York, and **CALVIN B. CARTER** succeeds him as manager of the export division there. Meyer became assistant manager of export sales for National Supply in 1949, and export division manager in 1952. He was elected vice-president and a director in 1958. In his new position, he will concentrate on for-

eign manufacturing and licensing, and on the development of National Supply's international activities. **James M. Davies** succeeds Carter as sales manager of the export division. Davies has been eastern district manager of National Supply Co. of Venezuela C. A., in Anaco, since 1957.

THOMAS D. McELROY is the new assistant general credit manager of National Supply Co., Pittsburgh. He will also continue to serve as division credit manager for the tubular division. He has been in credit and financial work with National Supply since 1932.

JOHN JORDEN, vice-president of Core Laboratories, Inc., is head of Core's new facilities in Buenos Aires, Argentina, and **JAMES A. CUSATOR,** also a Core vice-president, is head of the company's new facilities in Bogota, Colombia. Facilities in the two countries will be under the jurisdiction of Core Laboratories International. Jorden was formerly located at Core headquarters in Dallas, and Cusator was manager of the company's Shreveport (La.) district.

H. Schneider

B. E. Thomas

BILL E. THOMAS has been appointed sales manager, and **HAROLD SCHNEIDER** manager of the quality control department, of Tuboscope Co., Houston. Thomas has been Tuboscope's district sales manager in Houston since 1954. Schneider was most recently part owner and active manager of an oil tool manufacturing company. In his new position, he will supervise the training of personnel in field operating procedures, and will serve as technical advisor to the sales department. He will also manage the company's safety and fleet programs.

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Huntley 2-5450

New York 36 — Donald R. Thompson
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A Centennial Message for Producers

THE DOMESTIC PRODUCING INDUSTRY, which in three months will have completed 100 years of service, is far from retirement. That fact represents a striking rebuke to many prophets of doom.

Morgan J. Davis, president of Humble Oil & Refining Co., set the tenor with a strong testimonial for all domestic producers at the mid-year meeting of the Independent Petroleum Assn. of America.

Among the arguments Davis offered in support of his thesis that the domestic producing industry will be here for a long time to come were these:

(1) The industry is not running out of oil since, in his conservative opinion, crude reserves in existing fields and from acreage now under lease are in the range of 70-billion bbl., which can be produced by primary and secondary methods in the next 20 years.

(2) The industry should be able to develop 3-billion to 4-billion bbl. of gross liquid hydrocarbons annually in the next 20 years, or about three-fourths as much new oil as was developed in its first century.

(3) The industry's ability to develop new technology in finding and producing oil should not be underrated.

AN EQUALLY STRONG TESTIMONIAL to the domestic producing industry's shorter-term outlook came from the latest IPAA study of productive capacity. Its estimates, which over the years have proven conservative, show that by next Jan. 1 the domestic industry will have ability to produce nearly 10.8-million b/d of crude and natural gas liquids. Such a rate, the committee says, could be maintained from six to twelve months without further development and without significant loss in ultimate recovery.

Another IPAA committee estimates that by the first quarter of next year, total domestic production will run close to 8.6-million b/d. And at that level, the estimated productive capacity by that time will still provide a margin of more than 2.2-million b/d above requirements—a margin of domestic production that is available for any emergency.

MANY PROPHETS HAVE "SEEN" THE LAST BARREL of domestic oil many times. But so far, it hasn't been produced—nor will it be in the foreseeable future.

As Humble's chief executive put it: "Granted a reasonable political and economic climate without undue regulation or harassment, the oil industry can look forward to the future with confidence in its ability to turn in an outstanding performance—one that will continue to discredit the prophets of doom."

See three new BJ Power Tongs at Tulsa!

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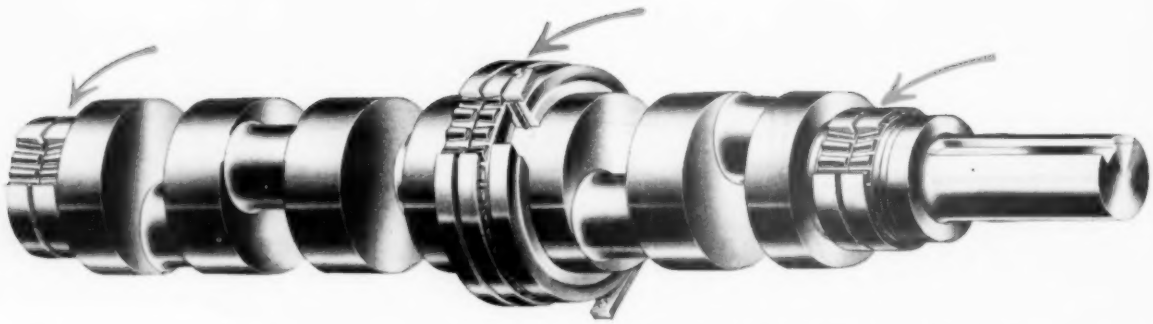

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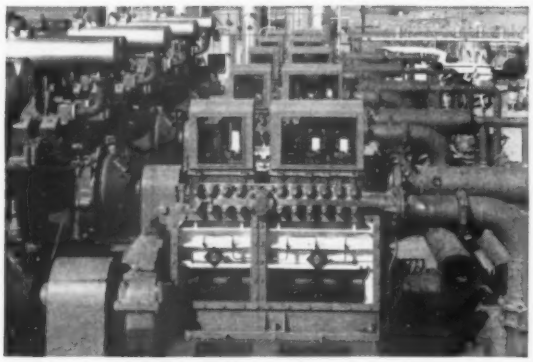

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